Simplify™

SANbox2 Switch Management

User's Guide

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Restoring disimilar switches; Restore available only for out-of-band switch	4.8

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Section 1
Introduction

This manual describes the switch management tools which include the SANbox Manager® application and the Command Line Interface (CLI). These switch management tools support SANbox2 switches.

The SANbox Manager switch management application is the primary focus of this manual which is organized as follows:

■ Section 1 describes the intended audience for this manual, related materials, and technical support.

■ Section 2 describes how to use SANbox Manager, its menus, and its displays.

■ Section 3 describes fabric management tasks.

■ Section 4 describes switch management tasks.

■ Section 5 describes port and device management tasks.

■ Appendix A describes the Command Line Interface.

A glossary of terms and an index are also provided.

1.1
Intended Audience

This manual introduces QLogic switch management products and explains their installation and use. It is intended for users responsible for installing and using network management tools.

1.2
Related Materials

Refer to the following manual for switch hardware and installation information:

■ *SANbox2-16 Fibre Channel Switch Installation Guide*, publication number 59021-03.

■ *SANbox2-8c Fibre Channel Switch Installation Guide*, publication number 59042-00.

1.3
Technical Support

Customers should contact their authorized maintenance provider for technical support of their QLogic switch products. QLogic-direct customers may contact QLogic Technical Support; others will be redirected to their authorized maintenance provider.

Visit the QLogic switch support Web site listed in 1.3.3 Contact Information for the latest firmware and software updates.

1.3.1
Availability

QLogic Technical Support is available from 7:00 AM to 7:00 PM Central Standard Time, Monday through Friday, excluding QLogic-observed holidays.

1.3.2
Training

QLogic offers the following technical training courses:

■ Switch Certification

■ HBA Certification

Each course is available at the training facility in Eden Prairie, MN or at your local facility. All courses include a Fibre Channel overview and sections on installation, maintenance, and topology solutions. Each student receives a set of manuals and a CD-ROM containing course training materials. Upon successful completion of the training, QLogic awards a certificate identifying the student as a Certified SANbox™ or SANblade™ Professional.

1.3.3
Contact Information

Address:	QLogic Switch Products Inc. 6321 Bury Drive Eden Prairie, Minnesota 55346 USA
Telephone:	+1 952-932-4040
Fax:	+1 952-932-4018
Email: Technical Service Technical Training	 support@qlogic.com tech.training@qlogic.com
Switch Support Web Site:	www.qlogic.com/support/home_support.asp

Section 2

Using SANbox Manager

This section describes how to use the SANbox Manager application and its menus. The following topics are covered:

■ Installing SANbox Manager

■ Starting SANbox Manager

■ Exiting SANbox Manager

■ Changing the password for the default fabric view file

■ Setting SANbox Manager user preferences

■ Using online help

■ SANbox Manager user interface

■ Using the topology display

■ Using the faceplate display

2.1
Installing SANbox Manager

The SANbox Manager application requires a management workstation with the following characteristics:

Table 2-1. Management Workstation Requirements

Operating System	■ Windows® NT, 2000, 95/98 ■ Linux® 6.2 Red Hat ■ Solaris™
Memory	128 MB or more
Disk Space	150 MB per installation
Processor	300 MHz or faster
Hardware	CD-ROM drive, RS-232 port, 10/100 Base-T Ethernet port
Internet Browser	Microsoft® Internet Explorer® or Netscape Navigator®

2.1.1
For Windows:

To install the SANbox Manager application on Windows from the SANsurfer® Tool Kit CD-ROM, do the following:

1. Close all programs currently running, and Insert the SANsurfer Tool Kit CD into the management workstation CD-ROM drive. If the SANsurfer Tool Kit start page does not open in your default browser, do the following:

    a. Using Windows Explorer, double-click the drive letter which contains the SANsurfer Took Kit CD.

    b. Locate and double-click the **Start_Here.htm** file to open the SANsurfer Tool Kit start page in your default browser.

2. On the SANsurfer Tool Kit start page, choose the **SANbox Switch Software** button.

3. On the SANbox Switch Software page, scroll to the SANbox2 (2Gb) Series area.

4. In the Windows column, choose the **SANbox Manager** link to open the File Download window.

5. You have a choice of running the installation file from the CD-ROM or downloading the installation file to your hard drive. Choose one of the following:

    ■ Open the installation file from the CD-ROM and follow the SANbox Manager installation instructions.

    ■ Specify a location in which to save the **sansurfer_windows_install.exe** file, and choose the **Save** button. Double-click the saved **sansurfer_windows_install.exe** file and follow the SANbox Manager installation instructions.

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Installing SANbox Manager

2.1.2
For Linux:

To install the SANbox Manager application on Linux from the SANsurfer Tool Kit CD-ROM, do the following:

1. Close all programs currently running, and insert the SANsurfer Tool Kit CD into the management workstation CD-ROM drive. If a file browser window opens showing icons for the contents of the CD-ROM, double-click the **Start_Here.htm** file to open the SANsurfer Tool Kit start page. If a file browser does not open, double-click the CD-ROM icon on the to open the browser. If there is no CD-ROM icon on the, do the following:

    a. Open an xterm or other terminal window.

    b. Mount the CD-ROM. From a shell prompt, enter the following command:

        ```
        mount /mnt/cdrom
        ```

    c. Execute your web browser to view the **Start_Here.htm** document using one of the following commands:

        ```
        $mozilla file:/mnt/cdrom/Start_Here.htm
        ```

        or

        ```
        $netscape file:/mnt/cdrom/Start_Here.htm
        ```

    d. The SANsurfer Tool Kit start page opens in your default browser.

2. On the SANsurfer Tool Kit start page, choose the **SANbox Switch Software** button.

3. On the SANbox Switch Software page, scroll to the SANbox2 (2Gb) Series area.

4. In the Linux column, choose the **SANbox Manager** link to open the Save As window.

5. Enter a path name to save the **sansurfer_linux_install.bin** file, and choose the **Save** button.

6. Open a terminal window for the directory in which the **sansurfer_linux_install.bin** file was saved, and enter the following command:

    ```
    chmod +x sansurfer_linux_install.bin
    ```

7. Press the **Enter** key.

8. Enter the following command:

    ```
    ./sansurfer_linux_install.bin
    ```

9. Press the **Enter** key, and follow the SANbox Manager installation instructions.

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2.1.3
For Solaris:

To install the SANbox Manager application on Solaris from the SANsurfer Tool Kit CD-ROM, do the following:

1. Close all programs currently running, and insert the SANsurfer Tool Kit CD into the management workstation CD-ROM drive. If the SANsurfer Tool Kit start page does not open in your default browser, do the following:

   a. Right-click the to open the Workspace Menu.

   b. Point to and select **Files**, then select **File Manager**.

   c. In File Manager, double-click the CD-ROM icon, and then double-click the Sansurfer folder.

   d. In the Sansurfer folder, double-click the **Start_Here.htm** file to open the SANsurfer Tool Kit start page in your default browser.

2. On the SANsurfer Tool Kit start page, choose the **SANbox Switch Software** button.

3. On the SANbox Switch Software page, scroll to the SANbox2 (2Gb) Series area.

4. In the Solaris column, choose the **SANbox Manager** link to open the Save As window.

5. Enter a path name to save the **sansurfer_solaris_install.bin** file and choose the **Save** button.

6. Open a terminal window for the directory in which the **sansurfer_solaris_install.bin** file was saved, and enter the following command:

   ```
   chmod +x sansurfer_solaris_install.bin
   ```

7. Press the **Enter** key.

8. Enter the following command:

   ```
   ./sansurfer_solaris_install.bin
   ```

9. Press the **Enter** key, and follow the SANbox Manager installation instructions.

Note: If you download SANbox Manager from a server, be sure the downloaded file has execute permission before installing.

2.2
Starting SANbox Manager

To start the SANbox Manager application for the first time, choose one of the following, and press the **Enter** key:

■ For a Windows platform, double-click the SANbox Manager shortcut, or select SANbox Manager from Start menu, depending on how you installed the SANbox Manager application.

■ For a Linux platform, enter the following on the command line:

```
# /SANbox_Manager/SANbox_Manager
```

■ For a Solaris platform, enter the following on the command line:

```
/usr/opt/QLogic_Corporation/SANbox_Manager/SANbox_Manager
```

The SANbox Manager application opens with the display shown in Figure 2-1.
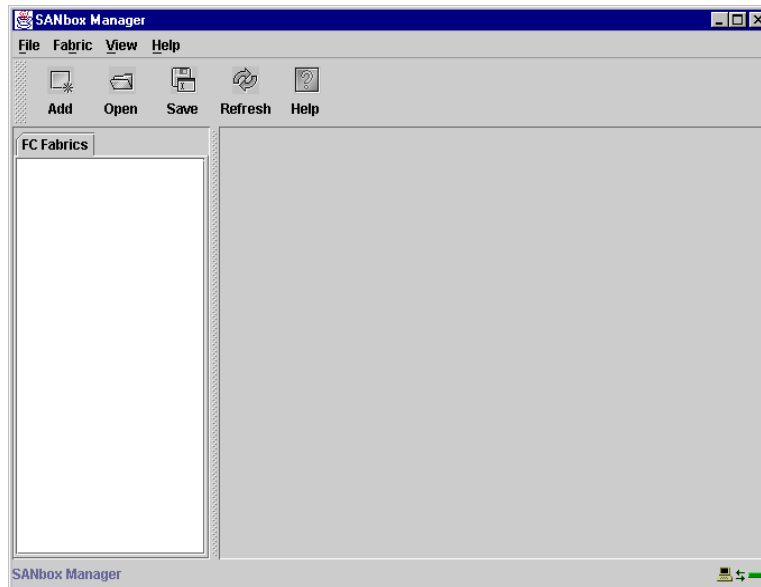
Figure 2-1. SANbox Manager Window

If the default fabric view file exists, the system prompts you to enter the file password as shown in Figure 2-2. Enter the password and choose the **Load View File** button to open the SANbox Manager application and load a previously saved set of fabrics. Otherwise, choose the **Continue Without Loading** button to open an empty fabric view. Choose **Add** button to open the Add a New Fabric window shown in Figure 2-3.
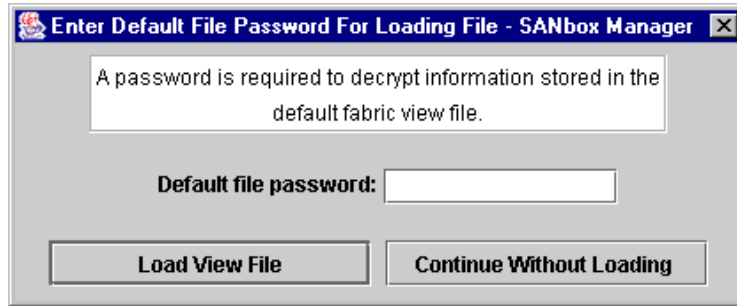
Figure 2-2. Load Default Fabric View File Window

To start using the SANbox Manager application, do the following to add a fabric:

1. Open the Fabric menu and select **Add Fabric** to open the Add a New Fabric window as shown in Figure 2-3.

Figure 2-3. Add a New Fabric Window

2. Enter a fabric name and the IP address of the switch through which to manage the fabric.

3. Enter an account name and a password. The factory account name is "admin" and the factory password is "password". If security is turned off (default), you are not required to enter an account name or password. This password is for the switch and is stored in the switch firmware. Refer to the User Command on page A-59 for more information.

4. Choose the **Add Fabric** button.

2.3
Exiting SANbox Manager

When exiting SANbox Manager, the current fabric view is encrypted and saved to the default fabric view file (fc_view.dft). A password is required to encrypt and save the default fabric view file the first time you exit SANbox Manager. When you exit subsequent sessions, SANbox Manager closes and saves the default fabric view file automatically without having to enter a password.

In your next session, SANbox Manager opens the default fabric view file automatically after entering its password. To prevent SANbox Manager from automatically saving the default fabric view file each time you exit SANbox Manager, set the View File Auto Save and Load preferences setting to Disable (Enable is the default). Refer to "Setting Preferences" on page 2-9 for more information.

To exit a SANbox Manager application session, open the File menu and select **Exit**. The system prompts you to enter a password with which to protect the default fabric view file as shown in Figure 2-4. Choose one of the following:

■   Enter a password and choose the **Save View File** button to save the current set of fabrics in the default fabric view file (fc_view.dft) in the working directory.

■   Choose the **Exit Without Saving** button to exit the application without saving the current fabrics to the default fabric view file.

■   Choose the **Cancel Exit** button to cancel the exit operation.
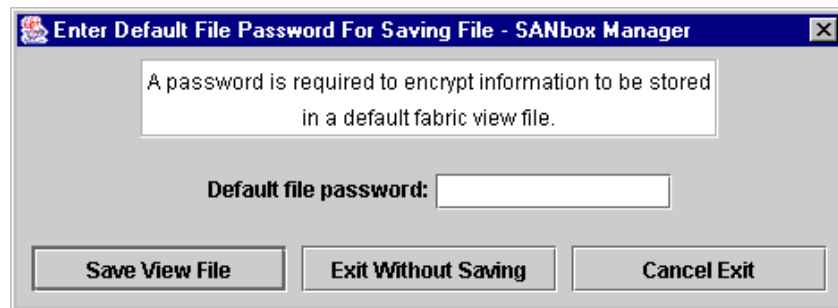
Figure 2-4. Save Current Fabric View Window

If the default fabric view file was saved with a password, the next time you open the SANbox Manager application, you will be prompted for the password in the Load Default Fabric View File window as shown in Figure 2-2. Your fabric opens after entering the password.

2.4
Uninstalling SANbox Manager

A program to uninstall SANbox Manager was installed as part of the SANbox Manager installation process. The Uninstaller Data folder in the Install folder contains the uninstall program (Uninstall SANbox Manager). Also, a shortcut/link to the uninstall program was installed in the user's home directory during the SANbox Manager installation process. The default installation directory is the user's home directory /QLogic_Corporation/SANbox_Manager.

To uninstall the SANbox Manager application:

1. Browse for the uninstall program file or the shortcut/link that points to the uninstall program file. The uninstall program shortcut is in the same folder as the program shortcut (Start menu, program group, on, or user specified) that is used to start the SANbox Manager application.

2. Double-click the uninstall program file or shortcut/link, and follow the instructions to uninstall the SANbox Manager application.

Note: For UNIX uninstalls, execute the link to Uninstall_SANbox_Manager. If no links were created during the installation, run: $INSTALL_DIR/UninstallerData/Uninstall_SANbox_Manager. Where INSTALL_DIR is the directory selected for installation.

2.5
Changing Default File Password

To change the password for the default fabric view file, do the following:

1. Open the File menu and select **Change Default File Password** to open the Set New Password window as shown in Figure 2-5.

Figure 2-5. Set New Password Window

2. Enter the new password in the Default File Password field.

3. Re-enter the same password in the Re-enter Password to Confirm field.

4. Choose the **OK** button to save the changes.

2.6
Setting Preferences

Using the Preferences settings, you can:

■   Change the location of the working directory (user's home directory is the default) used to save files

■   Change the location of the browser used to view the online help

■   Choose the polling frequency. That is, how often the SANbox Manager application polls the fabric. Rapid (default) is the normal polling level, Intermediate is 1.5 times slower than the rapid level, and Slow is 2 times slower than rapid level.

■   Enable or disable the default view file auto save and load feature. Refer to "Starting SANbox Manager" on page 2-5 for more information on the default fabric view file.

■   Choose the default port view when opening the faceplate display. Refer to "Monitoring Port Status" on page 5-2 for more information on port views.
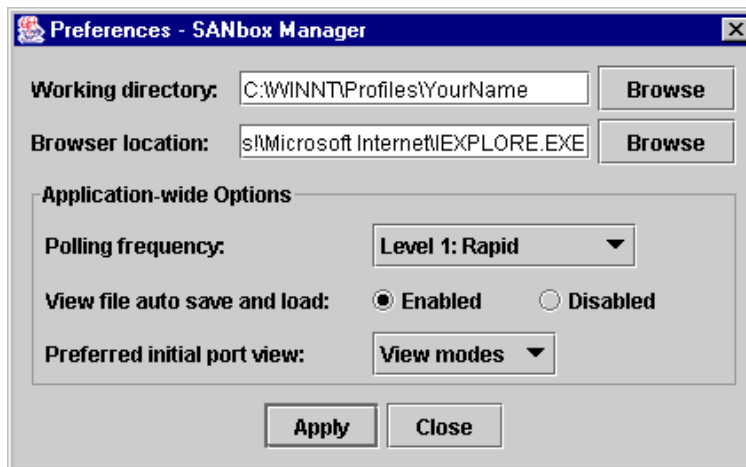
Figure 2-6. Preferences Window

To set user preferences for your SANbox Manager sessions, do the following:

1.   Open the File menu, and select **Preferences** to open the Preferences window.

2.   Enter or browse for paths to the working directory and browser.

3.   In the Application-wide Options area, choose the polling frequency, enable or disable the View File Auto Save and Load feature, and choose the initial port view when entering the faceplate display.

4.   Choose the **Apply** button to save the changes.

2.7
Using Online Help

Online help is available for the SANbox Manager application and its functions. The two ways to open the online help file are: open the Help menu and select **Help Topics**, or choose the **Help** button in the tool bar.

2.8
Viewing Software Version and Copyright Information

To view SANbox Manager software version and copyright information, open the Help menu and select **About....**

2.9
SANbox Manager User Interface

The SANbox Manager application uses two basic displays to manage the fabric and individual switches: the topology display and the faceplate display. The topology display shows all switches that are able to communicate and all connections between switches. The faceplate display shows the front of a single switch and its ports. Both displays share some common elements as shown in Figure 2-7.
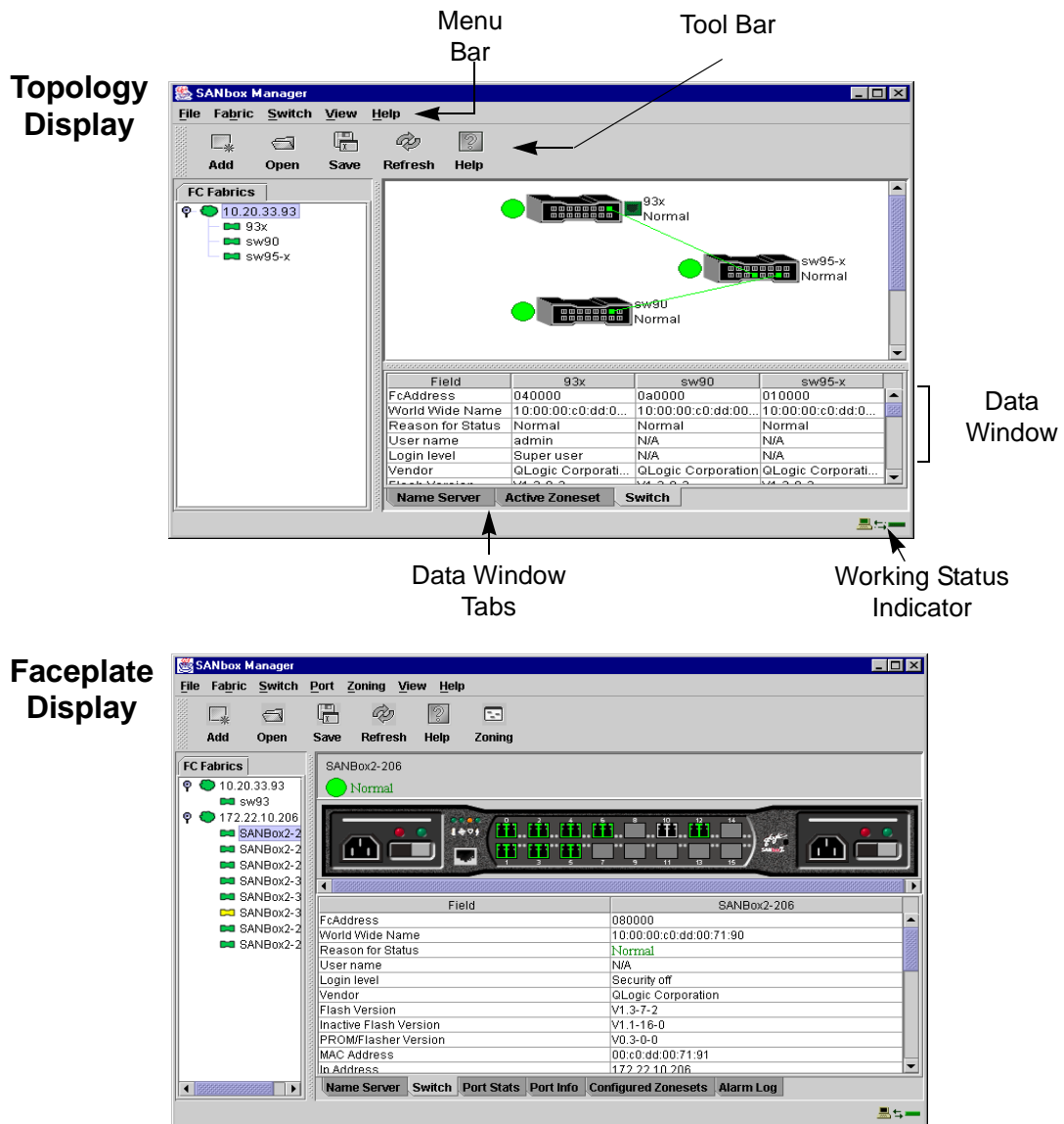
Figure 2-7. SANbox Manager Display Elements

2.9.1
Menu Bar

The Menu Bar presents the SANbox Manager menus as shown in Figure 2-8. The menus and the tasks offered in them vary depending on the display. For example, the Port menu and many of the Switch menu selections appear only in the faceplate display. Menu items with a gray background.

File	Fabric	Switch	Port
Open View File...	Add Fabric...	Delete	Port Properties
Save View As...	Remove Fabric	Export Name Server	Extended Credits
Change Default File Password	Rediscover Fabric	Archive	Reset Port
Preferences		Restore	Port Loopback Test
Exit		Load Firmware	
		Switch Properties	
		Network Properties	
		Toggle Beacon	
		Export Alarm Log	
		Reset Switch	
		Restore Factory Defaults	

Zoning	View	Help
Edit Zoning	Refresh	Help Topics
Edit Zoning Config	View Port Modes	About...
Activate Zone Set	View Port States	
Deactivate Zone Set	View Port Speeds	
Restore Default Zoning	View Port Media	

Figure 2-8. SANbox Manager Menu Structure

Some menu selections have shortcut keys as shown in Table 2-2.

Table 2-2. Menu Shortcut Keys

Shortcut Key	Menu Selection
F5 key	View>Refresh
Ctrl+O	File>Open View File

In addition to the menu bar, both the topology and faceplate displays have context sensitive menus that pop up when you click in the graphic window with the right mouse button. Refer to "Opening the Faceplate Display and Popup Menus" on page 2-17 for more information about these popup menus.

2.9.2
Tool Bar

The Tool Bar consists of a row of graphical buttons that you can use to access SANbox Manager functions as shown in Table 2-3. The tool bar buttons are an alternative method to using the menu bar.

Table 2-3. Tool Bar buttons

Tool Bar Button	Description
Add	Add Fabric button - adds a new a fabric.
Open	Open View File button - opens an existing fabric view file.
Save	Save View As button - saves the current fabric view to a file.
Refresh	Refresh button - polls fabric to update topology or faceplate display with current information.
Help	Help Topics button - opens the online help file.
Zoning	Edit Zoning button - opens the Edit Zoning window (available only in faceplate display).

2.9.3
Fabric Tree

The fabric tree lists the managed fabrics and their switches as shown in Figure 2-9. The window width can be adjusted by clicking and dragging the moveable window border. An entry handle located to the left of an entry in the tree indicates that the entry can be expanded. Click this handle or double-click the entry to expand or contract a fabric tree entry. A fabric entry expands to show its member switches.
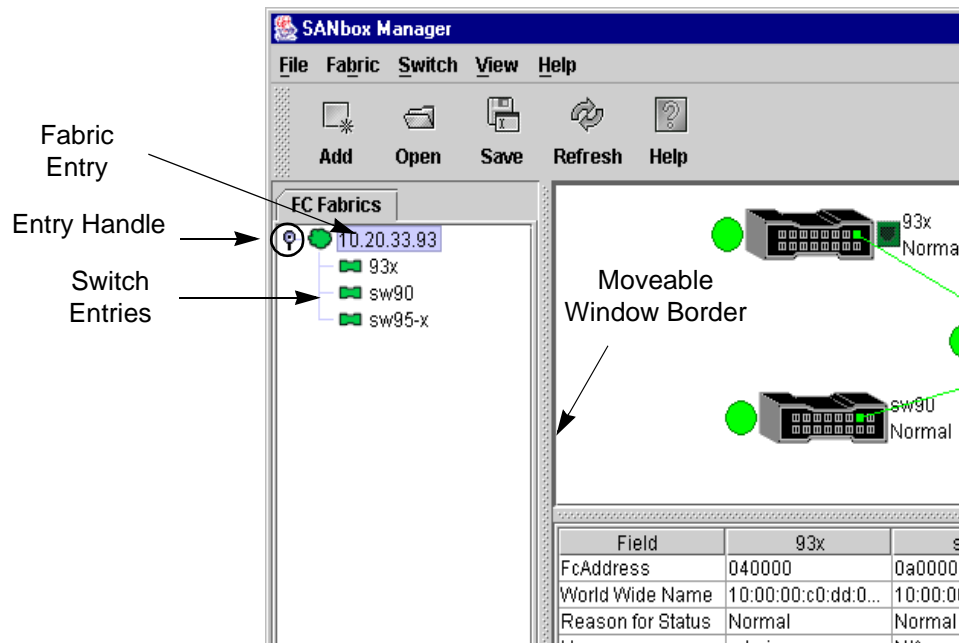
Figure 2-9. Fabric Tree

Each fabric tree entry has a small icon next to it that uses color to indicate operational status.

■   A green icon indicates normal operation.

■   A red icon indicates a communications failure.

■   A blue icon indicates that a switch is unknown, or a switch with security enabled when the fabric management switch has security disabled.

■   A yellow icon indicates that a switch is operational with errors.

The fabric tree provides access to the topology and faceplate displays for any fabric or switch.

■   To open the topology display from the fabric tree, click a fabric entry.

■   To open the faceplate display from the fabric tree, click a switch entry.

2.9.4
Graphic Window

The graphic window presents graphic information about fabrics and switches such as the fabric topology and the switch faceplate. The window length can be adjusted by clicking and dragging the window border that it shares with the data window.

2.9.5
Data Window and Tabs

The data window presents a table of data and statistics associated with the selected tab. Use the scroll bar to browse through the data. The window length can be adjusted by clicking and dragging the border that it shares with the graphic window.

Adjust the column width by moving the pointer over the column heading border shared by two columns until a right/left arrow graphic is displayed. Click and drag the arrow to the desired width.

The data window tabs present options for the type of information to display in the data window. These options vary depending on the display.

2.9.6
Working Status Indicator

The working status indicator, located in the lower right corner of SANbox Manager window, shows when the management workstation is exchanging information with the fabric. As conditions change, the fabric forwards this information to the management workstation where it is reflected in the various displays.

2.10
Using the Topology Display

The topology display shown in Figure 2-10 polls the selected fabric and displays its topology. Switches and inter-switch links (ISL) appear in the graphic window and use color to indicate status. Consider the following features of the topology display:

■ Switch and link status

■ Working with switches and links

■ Topology data windows
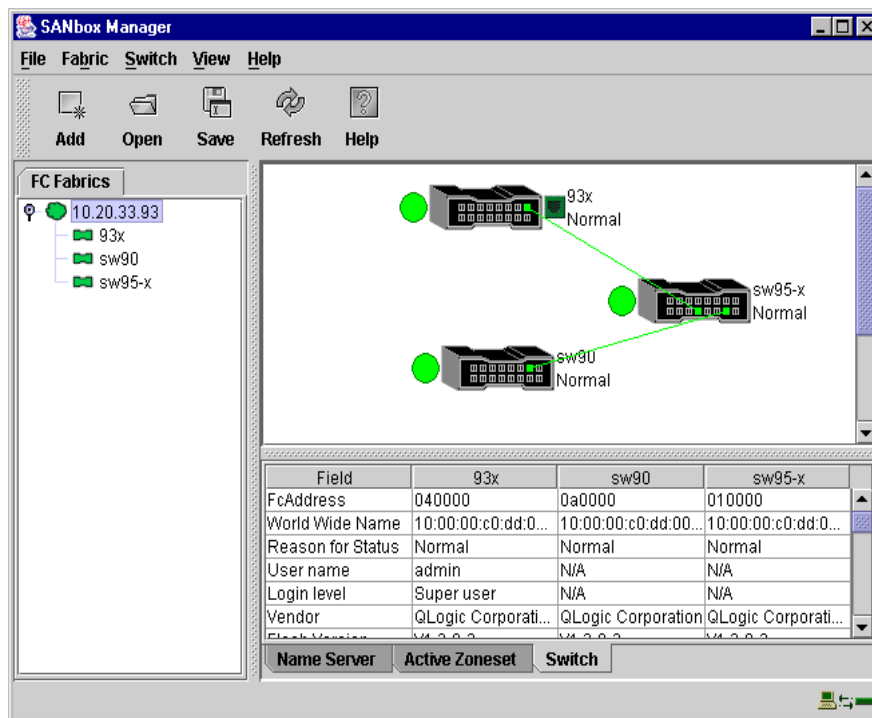
Figure 2-10. Topology Display

2.10.1
Switch and Link Status

Switch icon shape and color provide information about the switch and its operational state. Lines represent links between switches. The topology display uses green to indicate normal operation, yellow to indicate operational with errors, red to indicate inactive or failure, and blue to indicate unknown. Refer to "Fabric Status" on page 3-6 for more information about topology display icons.

2.10.2

Working with Switches and Links

Switch and link icons are selectable and moveable, and serve as access points for other displays and menus. You select switches and links to display information about them, modify their configuration, or delete them from the display. The context-sensitive popup menus are accessible through the switch and link icons.

2.10.2.1

Selecting Switches and Links

Selected switch icons are highlighted in violet. Selected ISLs are highlighted in yellow. You can select switches and links in the following ways.

■ To select a switch or a link, click the icon or link.

■ To select multiple switches or links, hold down the Control key and select.

■ To select all switches or links, right-click in the graphic window background. Select **Select All Switches** or **Select All Links** from the popup menu.

To cancel a selection, press and hold the Control key, and select the item again. To cancel multiple selections, click in the graphic window background.

2.10.2.2

Moving a Switch in the Display

To move a switch icon, click and drag the icon to another location in the graphic window. Links stretch or contract to remain connected.

2.10.2.3

Opening the Faceplate Display and Popup Menus

The faceplate display shows the front of a single switch and its ports.

■ To open the faceplate display when viewing the topology display, click the switch entry/icon in the fabric tree, or double-click the switch graphic.

■ To open the fabric popup menu when viewing the topology display, right-click the graphic window background. The fabric popup menu presents selections to refresh the fabric, select all switches, select all links, or layout topology.

■ To open the switch popup menu when viewing the topology display, right-click the switch icon in the graphic window. The switch popup menu presents selections to refresh the switch, delete the switch from the display, open the Switch Properties window, or open the Network Properties window.

■ To open the link popup menu, right-click the link. The Link popup menu presents a selection to delete the link from the display.

■ To open a faceplate display popup menu, right-click the faceplate graphic in the graphic window. The faceplate popup menu presents selections to refresh the switch, select all ports, manage switch, port, and network properties, extend credits, and run the Port Loopback tests.

2.10.3

Topology Data Windows

The topology display provides the following data windows corresponding to the data window tabs:

■ Name Server - displays all devices logged with the name server and their location within the current fabric configuration. Refer to "Name Server Data Window" on page 4-3 for more information.

■ Active Zoneset - displays the active zone set for the fabric including zones and their member ports. Refer to "Active Zone Set Data Window" on page 3-8 for more information about this data window. Refer to "Zoning a Fabric" on page 3-9 for information about zone sets and zones.

■ Switch - displays current network and switch configuration data for the selected switches. Refer to "Switch Data Window" on page 4-4 for more information.

2.11

Using the Faceplate Display

The faceplate display shown in Figure 2-11 displays the switch name and operational state, and port status. Consider the following functional elements of the faceplate display:

■ Port views and status

■ Working with ports

■ Faceplate data windows
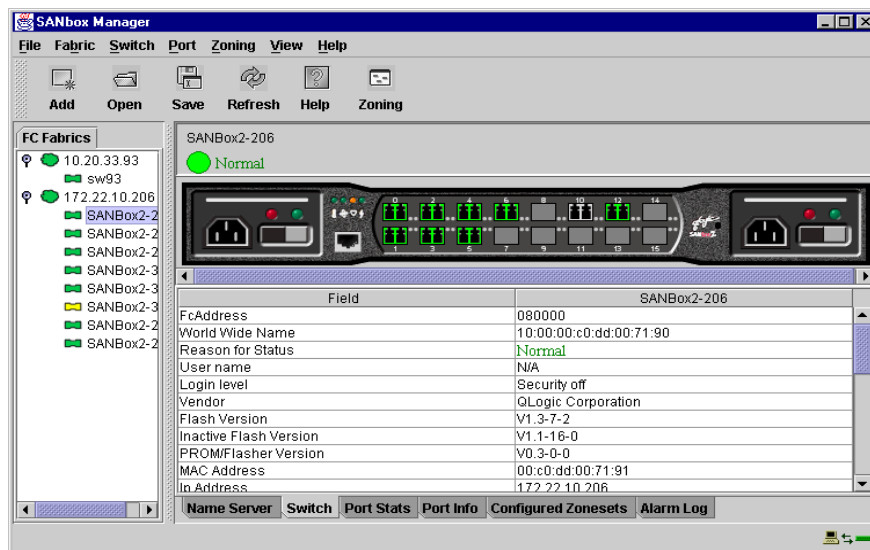
Figure 2-11. Faceplate Display

2.11.1
Port Views and Status

Port color and text provides information about the port and its operational state. Green indicates active; gray indicates inactive. The faceplate display provides the following views of port status corresponding to the View menu options in the faceplate display. Refer to "Monitoring Port Status" on page 5-2 for more information about these displays.

■ Port mode

■ Port state

■ Port speed

■ Port media

2.11.2
Working with Ports

Ports are selectable and serve as access points for other displays and menus. You select ports to display information about them in the data window or to modify them. Context sensitive popup menus and properties windows are accessible through the faceplate and port icons.

2.11.2.1
Selecting Ports

You can select ports in the following ways. Selected ports are highlighted with a white border.

■ To select a port, click the port in the faceplate display.

■ To select a range of consecutive ports, select a port, then press and hold the shift key and select another port. The application selects both end ports and all ports in between in port number sequence.

■ To select several non-consecutive ports, hold the Control key while selecting.

■ To select all ports, right-click anywhere in the graphic window. Select **Select All Ports** from the popup menu.

To cancel a selection, press and hold the Control key and select it again.

2.11.2.2

Opening Popup Menus

Using the right mouse button, you can open the faceplate popup menu. This popup menu presents several selections to manage the switch and its ports.

■ To open the popup menu, right-click anywhere in the graphic window. If no ports are selected, port specific tasks will be unavailable in the menu.

■ To select one or more ports and open the Port popup menu, right-click a port.

2.11.3

Faceplate Data Windows

The faceplate display provides the following data windows corresponding to the data window tabs:

■ Name Server - displays all devices connected to the switch that are logged with the name server.

■ Switch - displays current switch configuration data.

■ Port Statistics - displays port performance data for the selected port(s).

■ Port Information - displays port detail information for the selected port.

■ Configured Zonesets - displays all zone sets, zones, and zone membership in the zoning database.

■ Alarm Log - displays the system error information.

Section 3
Managing Fabrics

This section describes the following tasks that manage fabrics:

■   Security

■   Managing the fabric database

■   Displaying fabric information

■   Zoning a fabric

3.1
Security

The two components of SANbox2 security are user authentication and fabric security. The user must be authenticated before gaining access to a switch. If an invalid account name/password combination is entered, that user can not access the switch, and thus can not gain access to the fabric. If security is enabled (on) and a valid account name/password combination is entered, that user can access the switch but can not execute any command that exceeds their authority (privileges) level. If security is disabled (off) and a valid account name/password combination is entered, that user has access to all switches in the fabric and can execute all commands (both user and admin), regardless of their authority (privileges) level.

3.1.1
User Authentication

User authentication pertains to accessing a switch based on a valid account name/password combination entered by the user. The valid account name/password/system privileges combinations are set up by the system administrator, and define which set of system commands each user may execute if a valid account name/password combination is entered. The system privileges are tied to the account name/password combination.

3.1.2
Fabric Security

Fabric security pertains to whether all switches in the fabric are configured to permit access to each switch in that fabric. All switches in the fabric should be configured with the same security setting (enabled/true or disabled/false). By default, security is disabled. Once access is gained to the entry switch in a fabric, that user may access all switches in that fabric.
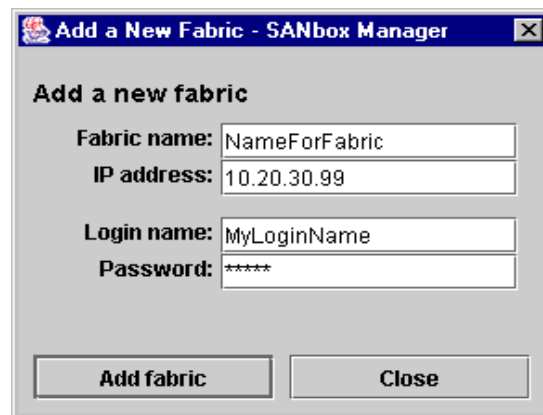
3.2

Managing the Fabric Database

A fabric database contains the set of fabrics that you have added during a SANbox Manager session. Initially, the SANbox Manager application opens with an empty fabric database.

3.2.1

Adding a Fabric

To add a fabric to the database, do the following:

1. Open the Fabric menu and select **Add Fabric** to open the Add a New Fabric window as shown in Figure 3-1.

Figure 3-1. Add a New Fabric Window

2. Enter a fabric name and the IP address of the switch through which to manage the fabric.

3. Enter an account name. The factory account name and password are (admin, password). Choose the **Add Fabric** button.

    This password is for the switch and is stored in the switch firmware. If security is turned off (default), you are not required to enter an account name or password. Refer to ”Security” on page 3-1. Refer to the Set Setup Command on page A-34 for account name, password, and security information.

Note: A switch supports a combined maximum of 15 logins. This includes SANbox Manager inband and out-of-band logins, Telnet out-of-band logins, and SNMP out-of-band logins. Additional logins will be refused.

3.2.2
Removing a Fabric

To delete a fabric file from the database, do the following:

1.   Select a fabric in the fabric tree.

2.   Open the Fabric menu and select **Remove Fabric**.

3.2.3
Opening a Fabric View File

To open an existing view file, do the following:

1.   Open the File menu, and select **Open View File**, or choose the **Open** button. If the fabric you are currently has changed, you will be prompted to save the changes to the view file before opening a different view file.

2.   In the Open View window, enter the name of the file to open.

3.   Enter a file password, if necessary.

4.   Choose the **Load View File** button. If the fabric has changed, you will be prompted to save before opening the new view.

3.2.4
Saving a Fabric View File

To save a view file, do the following:

1.   Open the File menu, and select **Save View As**.

2.   In the Save View window, enter a new file name.

3.   Enter a file password, if necessary.

4.   Choose the **OK** button.

3.2.5
Rediscovering a Fabric

After making changes to or deleting switches from a fabric view, it may be helpful to again view the actual fabric configuration. The rediscover fabric option clears out the current fabric information being displayed, and rediscovers all switch information. To rediscover a fabric, open the Fabric menu, and select **Rediscover Fabric**.

3.2.6
Adding a New Switch to a Fabric

If there are no special conditions to be configured for the new switch, simply plug in the switch and the switch becomes functional with the default fabric configuration. The default fabric configuration settings are:

- Fabric zoning is sent to the switch from the fabric.

- All ports will be GL_Ports.

- The default IP address 10.0.0.1 is assigned to the switch without a gateway or boot protocol configured (RARP, BOOTP, and DHCP).

If you are adding a new switch to a fabric and do not want to accept the default fabric configuration, do the following:

1. If the switch is not new, reset the switch to factory configuration before adding the switch to the fabric using the Restore Factory Defaults option in the Switch menu.

2. If you want to manage the switch through the Ethernet port, you must first configure the network SNMP configuration using the Network Properties window.

3. Configure any special switch settings (default visibility, broadcast support, and orphan zone behavior). We suggest configuring Default Visibility setting to None in the Zoning Config window to prevent communication with other switches in the fabric until the new switch is configured.

4. Plug in the inter-switch links (ISL), but do not connect the devices.

5. Configure the port types for the new switch (GL_Port, TL_Port, Donor) using the Port Properties window.

6. Connect the devices to the switch.

7. Make any necessary zoning changes using the Edit Zoning window.

3.2.7
Replacing a Failed Switch in a Fabric

To replace a failed switch in a fabric, plug in the switch and copy the archived switch configuration file to the switch using the Restore function. Refer to "Restoring a Switch" on page 4-16 and "Archiving a Switch" on page 4-15 for more information. The switch configuration must be archived before it can be restored.

To replace a failed switch using the SANbox Manager Restore function:

1. Unplug and remove the failed switch.

2. Plug in the new replacement switch.

3. Open the topology display and select the replacement switch.

4. Open the Switch menu and select **Restore**.

5. In the Restore Switch window, enter a name or choose the archived switch configuration file to copy to the switch.

6. Choose the **OK** button to write the configuration file to the switch.

3.2.8
Deleting Switches and Links

The SANbox Manager application does not automatically delete switches or links that have failed or have been physically removed from the Fibre Channel network. In these cases, you can delete switches and links to bring the display up to date. If you delete a switch or a link that is still active, the SANbox Manager application will restore it automatically. You can also refresh the display. To delete a switch from the topology display, do the following:

1. Select one or more switches in the topology display.

2. Open the Switch menu and select **Delete**.

To delete a link, do the following:

1. Select one or more links in the topology display.

2. Open the Switch menu and select **Delete**.

3.3
Displaying Fabric Information

The topology display is your primary tool for monitoring a fabric. The graphics window of the topology display provides status information for switches, inter-switch links, and the Ethernet connection to the management workstation.

The data window tabs show name server, switch, and active zone set information. The Active Zoneset tab shows the zone definitions for the active zone set. Refer to "Name Server Data Window" on page 4-3 and "Switch Data Window" on page 4-4 for information about the Name Server and Switch data windows.

3.3.1
Fabric Status

The fabric updates the topology and faceplate displays by forwarding changes in status to the management workstation as they occur. You can allow the fabric to update the display status, or you can refresh the display at any time. To refresh the topology display, do one of the following:

■ Choose the **Refresh** button.

■ Open the View menu and select **Refresh**.

■ Press the F5 key.

■ Right-click anywhere in the background of the topology display and select **Refresh Fabric** from the popup menu.

The topology display uses switch and status icons to provide status information about switches, inter-switch links, and the Ethernet connection. The switch icons indicate 16 port switch or an unknown switch type. The switch status icons, displayed on the left side of a switch, vary in shape and color. Switches controlled by an Ethernet Internet Protocol have a colored Ethernet icon displayed on the right side of the switch. A green Ethernet icon indicates normal operation, yellow indicates operational with errors, and red indicates inactive or failure. Table 3-1 shows the different switch icons and their meanings.

Table 3-1. Topology Display Switch and Status Icons

Switch Icon	Description
	SANbox2 Switch Normal operation (Green)
	SANbox2-8c Switch Normal operation (Green)
	Non-QLogic Switch, or a QLogic Switch with different security than the fabric management switch.
	Switch communication normal (Green)
	Switch is operational with errors (Yellow)

Table 3-1. Topology Display Switch and Status Icons (Continued)

Switch Icon	Description
	Switch communication interrupted (Red)
	Switch management communication unknown (Blue)
	Fabric Management Switch Ethernet connection normal (Green)
	Fabric Management Switch Ethernet connection critical (Red)
	Fabric Management Switch Ethernet connection warning (Yellow)

3.3.2
Active Zone Set Data Window

The Active Zoneset data window displays the zone membership for the active zone set. To open the Active Zoneset data window, choose the **Active Zoneset** tab below the data window in the topology display. Refer to "Configured Zonesets Data Window" on page 4-6 for information about the zone set definitions on a particular switch. Refer to "Zoning a Fabric" on page 3-9 for more information about zone sets and zones.

The Active Zoneset data window, shown in Figure 3-2, uses display conventions for expanding and contracting entries that are similar to the fabric tree. An entry handle located to the left of an entry in the tree indicates that the entry can be expanded. Click this handle or double-click the following entries to expand or contract them:

■   A zone set entry expands to show its member zones.

■   A zone entry expands to show its member ports.

■   A port entry expands to show the port Fibre Channel address.

■   A Fibre Channel address entry expands to show the port worldwide name.
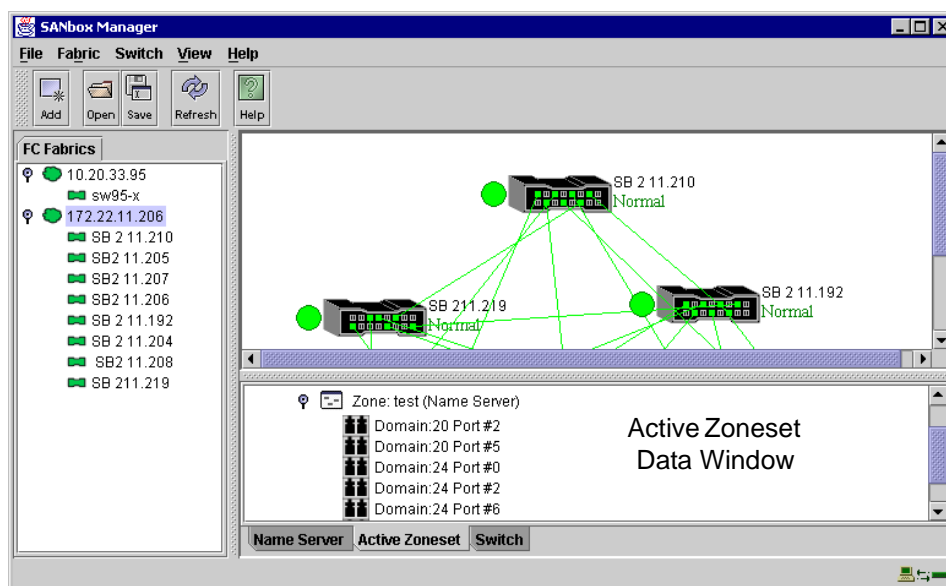
Figure 3-2. Active Zone Set Data Window

3.4
Zoning a Fabric

Zoning enables you to divide the ports and devices of the fabric into zones for more efficient and secure communication among functionally grouped nodes. This subsection addresses the following topics:

■ Zoning concepts

■ Using the Zoning Config window

■ Restoring default zoning

■ Merging fabrics and zoning

■ Using the Edit Zoning window

■ Managing zone sets

■ Managing zones

■ Managing aliases

3.4.1
Zoning Concepts

The following zoning concepts provide some context for the zoning tasks described in this section:

■ Zones

■ Aliases

■ Zone sets

■ Zoning database

■ Zoning configuration

3.4.1.1
Zones

A zone is a named group of ports or devices that can communicate with each other. Membership in a zone can be defined by port number, device Fibre Channel address, or device World Wide Name (WWN). Zone members can communicate only with members of the same zone. Zones can overlap; that is, a port or device can be a member of more than one zone.

Note: Domain ID conflicts can result in automatic reassignment of switch domain IDs. These reassignments are not reflected in zones that use domain ID and port number pairs or Fibre Channel addresses to define their membership. Be sure to reconfigure zones that are affected by a domain ID change. To prevent zoning definitions from becoming invalid when the membership is defined by domain ID/port number or Fibre Channel address, use the Set Config Switch command to lock domain IDs. Refer to the "Set Config Command" on page A-24.

Three types of zones are supported. The following zone types define increasing restrictive levels of communication.

■ Soft zone

■ Access Control List (ACL) - hard zone

■ Virtual Private Fabric (VPF) - hard zone

3.4.1.1.1
Soft Zones

Soft zoning divides the fabric for purposes of controlling discovery. Members of the same soft zone automatically discover and communicate freely with all other members of the same zone. The soft zone boundary is not secure; traffic across soft zones can occur if addressed correctly. Soft zones that include members from multiple switches need not include the ports of the inter-switch links. Soft zone boundaries yield to ACL and VPF zone boundaries. Soft zones can overlap; that is, a port can be a member of more than one soft zone. Membership can be defined by Fibre Channel address, port ID and domain ID, or worldwide name. Soft zoning supports all port modes.

3.4.1.1.2
Access Control List Hard Zones

Access Control List (ACL) zoning divides the fabric for purposes of controlling discovery and inbound traffic. ACL zoning is a type of hard zoning that is hardware enforced. This type of zoning is useful for controlling access to certain devices without totally isolating them from the fabric. Members can communicate with each other and transmit outside the ACL zone, but cannot receive inbound traffic from outside the zone. The ACL zone boundary is secure against inbound traffic. ACL zones can overlap; that is, a port can be a member of more than one ACL zone. ACL zones that include members from multiple switches need not include the ports of the inter-switch links. ACL zone boundaries supersede soft zone boundaries, but yield to VPF zone boundaries. Membership can be defined only by port ID and domain ID. ACL zoning supports all port modes except TL_Ports.

3.4.1.1.3
Virtual Private Fabric Hard Zones

Virtual Private Fabric (VPF) zoning divides the fabric for purposes of controlling discovery and both inbound and outbound traffic. This type of zoning is useful for providing security and reserving paths between devices to guarantee bandwidth. VPF zoning is a type of hard zoning that is hardware enforced. Members can only transmit to and receive from members of the same VPF zone. The VPF zone boundary is secure against both inbound and outbound traffic. VPF zones that include members from multiple switches must include the ports of the inter-switch links. VPF zones cannot overlap; that is, a port can be a member of only one VPF zone. VPF zone boundaries supersede both soft and ACL zone boundaries. Membership can be defined only by port ID and domain ID. VPF zoning supports all port modes.

3.4.1.2
Aliases

To make it easier to add a group of ports or devices to one or more zones, you can create an alias. An alias is a named set of ports or devices that are grouped together for convenience. Unlike zones, aliases impose no communication restrictions between its members. You can add an alias to one or more zones. However, you cannot add a zone to an alias, nor can an alias be a member of another alias.

3.4.1.3
Zone Sets

A zone set is a named group of zones. A zone can be a member of more than one zone set. All zones that are not members of a zone set belong to the orphan zone set. The orphan zone set is saved to the switch. Each switch in the fabric maintains its own zoning database containing one or more zone sets. This zoning database resides in non-volatile or permanent memory and is therefore retained after a reset. Refer to "Configured Zonesets Data Window" on page 4-6 for information about displaying the zoning database.

To apply zoning to a fabric, choose a zone set and activate it. When you activate a zone set, the switch distributes that zone set to every switch in the fabric. Therefore, every switch in the fabric will have identical active zone sets. Refer to "Active Zone Set Data Window" on page 3-8 for information about displaying the active zone set.

3.4.1.4
Zoning Database

Each switch has its own zoning database. The zoning database is made up of all aliases, zones, and zone sets that have been created on the switch or received from other switches. The switch maintains two copies of the zoning database: one copy is maintained in temporary memory for editing purposes; the second copy is maintained in permanent memory. When you modify aliases, zones, and zone sets, these changes are made to the temporary zoning database. If you reset the switch or lose power to the switch before saving the permanent zoning database, the changes will be lost.

The Auto Save zoning configuration parameter controls whether the temporary zoning database is automatically saved in permanent memory. Refer to "Zoning Configuration" on page 3-13 for more information about the Auto Save parameters.

3.4.1.5
Zoning Configuration

Note the following SANbox2 zoning configuration concepts:

■ Orphan zones are allowed.

■ You can not edit an active zone set.

■ The three types of zones are Soft, VPF, and ACL.

■ Aliases are allowed.

■ The zoning limits for a fabric are:

  ■ Maximum number of zonesets is 256

  ■ Maximum number of zones is 256

  ■ Maximum number of aliases is 256

  ■ Maximum number of members per zone is 2000

  ■ Maximum number of members per aliases is 2000

  ■ Maximum total number of members is 2000

■ The entire zoning database can be saved to either temporary or permanent memory.

You can set the zoning configuration parameters using SANbox Manager or the Set Zoning Config command. Refer to "Using the Zoning Config Window" on page 3-15 for information about zoning configuration using SANbox Manager. Refer to "Set Config Command" on page A-24 for information about the Set Config command.

The following parameters make up the zoning configuration:

■ Auto Save

■ Merge Mode

■ Default Visibility

3.4.1.5.1
Auto Save

The Auto Save parameter on a switch determines whether zoning changes received from other switches in the fabric will be automatically saved to permanent memory on that switch. Zoning changes you apply to your switch are automatically saved to permanent memory on your switch, but where those changes are saved on each switch in the fabric is dependent on whether a switch has the Auto Save parameter enabled or disabled.

Zoning changes are saved to temporary memory on all switches in the fabric. If Auto Save is enabled, the switch firmware automatically saves the zoning changes it receives to both temporary and permanent memory on that switch. If Auto Save is disabled on a switch, any zoning changes that the switch receives will be stored only in its temporary memory.

How the save operation is triggered depends on the selected merge mode. When in SW-2 merge mode, changes are saved when an updated zone set is activated. When in Brocade™ merge mode, changes are saved when any zone set is updated. You can save the zoning database to permanent memory (if Auto Save is disabled) using the Zoning command. Refer to Zoning Command on page A-67.

3.4.1.5.2
Merge Mode

The Merge Mode parameter enables a SANbox2 switch to interoperate with Brocade switches running non-FC-SW-2-compliant firmware. There are two merge modes: SW2 and Brocade Proprietary. The SW2 merge mode is intended for FC-SW-2 compliant switches. The Brocade merge mode is intended for SANbox2 fabrics that include Brocade switches with non-FC-SW-2 compliant firmware. All switches in a fabric should be set to the same merge mode, otherwise the switches may become isolated from each other.

When you activate a zone set, the SW2 merge mode causes the active zone set to be distributed to temporary memory on all switches in the fabric. This ensures that all switches have identical active zone sets. The Brocade merge mode propagates the entire zoning database to temporary memory on all switches in the fabric anytime the zoning database is changed and saved on any switch.

3.4.1.5.3
Default Visibility

Default Visibility determines the level of communication that is permitted between devices when there is no active zone set. The default visibility parameter can be set differently on each switch. When default visibility is enabled (All) on a switch, the switch and its devices can communicate with all devices in the fabric. When Default Visibility is disabled (None) on a switch, none of the ports on that switch can communicate with any other port in the fabric.

3.4.2
Using the Zoning Config Window

Use the Zoning Config window to change the Auto Save, Merge Mode, and Default Visibility configuration parameters. In the faceplate display, open the Zoning menu and select **Edit Zoning Config** to open the Zoning Config window shown in Figure 3-3. After making changes, choose the **OK** button to put the new values into effect.
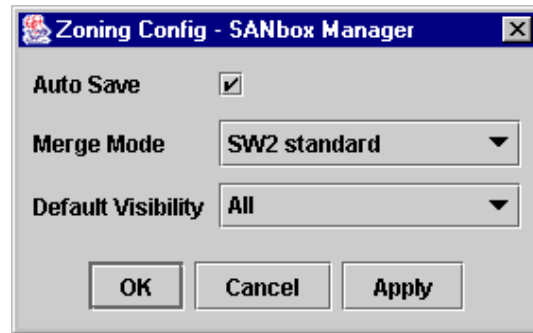
Figure 3-3. Zoning Config Window

3.4.3
Restoring Default Zoning

Restoring the default zoning clears the switch of all zoning definitions.

CAUTION!	The use of this command will deactivate any active zone set. If the switch is not isolated from the fabric, this command will deactivate the active zone set for the entire fabric.

To restore the default zoning for a switch:

1. In the faceplate display, open the Zoning menu and select **Restore Default Zoning**.

2. Choose the **OK** button to confirm that you want to restore default zoning and save changes to the zoning database.

3.4.4

Merging Fabrics and Zoning

If you join two fabrics, the active zone sets from the two fabrics attempt to merge. The fabrics may consist of a single switch or many switches already connected together. The switches in the two fabrics attempt to create a new active zone set containing the union of each fabric's active zone set. The propagation of zoning information only affects the active zone set, not the configured zone sets, unless the Merge Mode is set to "Brocade Proprietary". Refer to "Merge Mode" on page 3-14.

3.4.4.1

Zone Merge Failure

If a zone merge is unsuccessful, the inter-switch links between the fabrics will isolate due to a zone merge failure, which will generate an alarm log entry. The reason for the E_Port isolation can also be determined by viewing the port information. Refer to "Port Information Data Window" on page 4-5 and the "Show Command" on page A-39 (Port keyword).

A zone merge will fail under the following conditions:

■ The Merge Mode in the two fabrics is different. All switches in the combined fabric must have the same merge mode.

■ The two active zone sets have member zones with identical names that differ in content or type. For example, consider Fabric A and Fabric B each with a zone in its active zone set named "ZS1". Fabric A "ZS1" contains a member specified by Domain ID 1 and Port 1; Fabric B "ZS1" contains a member specified by Domain ID 1 and Port 2. In this case, the merge will fail and the inter-switch links between the fabrics will isolate.

3.4.4.2

Zone Merge Failure Recovery

When a zone merge failure occurs, the conflict that caused the failure must be resolved. If the failure was due to differing Merge Modes, change the Merge Mode on the switches in one of the fabrics to match the other fabric. Refer to "Using the Zoning Config Window" on page 3-15 for information about changing the Merge Mode. To permit the fabrics to join, reset the ports that were isolated. Refer to "Resetting a Port" on page 5-13.

1. You can correct a failure due to a zone conflict by deactivating one of the active zone sets or editing the conflicting zones so that their membership is the same. You can deactivate the active zone set on one switch if the active zone set on the other switch accurately defines your zoning needs. If not, you must edit the zone memberships, and reactivate the zone sets. Refer to "Managing Zones" on page 3-22 for information about adding and removing zone members. To permit the fabrics to join, reset the ports that were isolated. Refer to "Resetting a Port" on page 5-13.

3.4.5
Using the Edit Zoning Window

To edit the zoning database for a particular switch, open the Zoning menu from the faceplate display and select **Edit Zoning** to open the Edit Zoning window shown in Figure 3-4. Changes can only be made to an inactive zone set, which will be stored in flash (non-volatile) memory and retained after resetting a switch.

The Edit Zoning window has a Zone Sets tree on the left and a Port/Device (or members) tree on the right. Both trees use display conventions similar to the fabric tree for expanding and contracting zone sets, zones, and ports. An expanded port shows the port Fibre Channel address; an expanded address shows the port worldwide name. You can select zone sets, zones, and ports in the following ways:

■   Click a zone, zone set, or port icon.

■   Right-click to select a zone set or zone, and open the corresponding popup menu.

■   Hold down the Shift key while clicking several consecutive icons.

■   Hold down the Control key while clicking several non-consecutive icons.
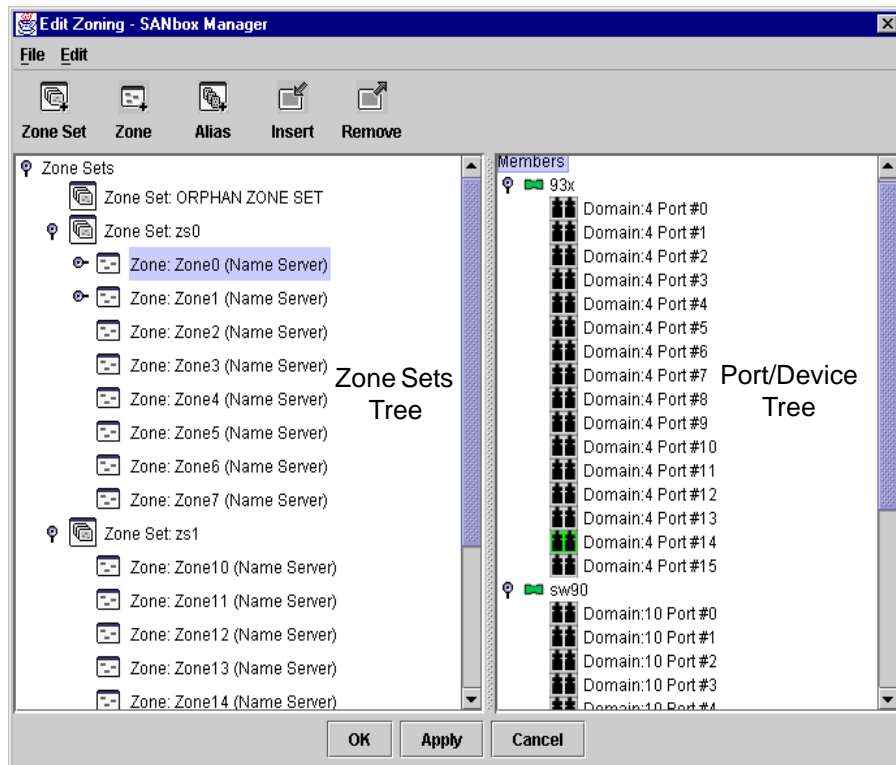
Figure 3-4. Edit Zoning Window

Using tool bar buttons, popup menus, or a drag-and-drop method, you can create and manage zone sets and zones in the zoning database. The **Apply** button saves changes to the zoning database without closing the window. The **OK** button saves the zoning changes to the database and closes the window. The tool bar presents the following operations:

Table 3-2. Edit Zoning Window Tool Bar Buttons

Tool Bar Button	Description
Zone Set	Create Zone Set button - create a new zone set
Zone	Create Zone button - create a new zone
Alias	Create Alias button - create another name for a set of objects
Insert	Add Member button - add the selected zone to a zone set, or add the selected port to a zone
Remove	Remove Member button - delete the selected zone from a zone set, or delete the selected port from a zone

3.4.6
Managing Zone Sets

Zoning a fabric involves creating a zone set, creating zones as zone set members, then adding devices as zone members. The zoning database supports multiple zone sets to serve the different security and access needs of your storage area network, but only one zone set can be active at one time. Managing zone sets consists of the following tasks:

■ Creating zone sets

■ Activating and deactivating zone sets

■ Copying a zone to a zone set

■ Removing a zone from one zone set or from all zone sets

■ Removing a zone set

■ Removing all zoning definitions

Note: Changes that you make to the zoning database behave as follows:

■ In SW2 merge mode, changes to configured zone sets are limited to the managed switch and do not propagate to the rest of the fabric. To distribute changes to configured zone sets fabric wide, you must edit the zoning databases on the individual switches.

■ In Brocade merge mode, when a zone set is activated, the entire zoning database, including any changes, is distributed from the managed switch throughout the fabric.

3.4.6.1
Creating a Zone Set

To create a zone set, do the following:

1. Open the Zoning menu, and select **Edit Zoning** to open the Edit Zoning window.

2. Open the Edit menu, and select **Create Zone Set** to open the Create Zone Set window.

3. Enter a name for the zone set, and choose the **OK** button. The new zone set name is displayed in the Zone Sets window.

4. To create new zones in a zone set, do one of the following:

   ■ Right-click a zone set and select **Create A Zone** from the popup menu. In the Create a Zone window, enter a name for the new zone, and choose the **OK** button. The new zone name is displayed in the Zone Sets window.

   ■ Copy an existing zone by dragging a zone into the new zone set. Refer to ”Copying a Zone to a Zone Set” on page 3-21.

5. Choose the **Apply** button to save changes to the zoning database.

3.4.6.2
Activating and Deactivating a Zone Set

You must activate a zone set to apply its zoning definitions to the fabric. Only one zone set can be active at one time. When you activate a zone set, the switch distributes that zone set to the temporary zoning database on every switch in the fabric replacing any zone set of the same name. If Auto Save is enabled, the zone set is saved in the permanent zoning database also. Refer to ”Auto Save” on page 3-14.

The purpose of the deactivate function is to suspend all fabric zoning which results in free communication fabric wide or no communication depending on the default visibility setting. Refer to ”Default Visibility” on page 3-14 for more information. It is not necessary to deactivate the active zone set before activating a new one.

■ To activate a zone set, open the Zoning menu and select **Activate Zone Set** to open the Activate Zone Set window. Select a zone set from the Select Zone Set pull-down menu, and choose the **Activate** button.

■ To deactivate the active zone set, open the Zoning menu, select **Deactivate Zone Set**. Acknowledge the warning about traffic disruption, and choose the **Yes** button to confirm that you want to deactivate the active zone set.

3.4.6.3
Copying a Zone to a Zone Set

To copy an existing zone and its membership from one zone set to another, select the zone and drag it to the chosen zone set. Choose the **Apply** button to save changes to the zoning database.

3.4.6.4
Removing a Zone from a Zone Set or from All Zone Sets

You can remove a zone from a zone set or from all zone sets in the database.

1. In the Faceplate Display, open the Zoning menu and select **Edit Zoning** to open the Edit Zoning window.

2. In the Zone Sets tree, select the zone(s) to be removed.

3. Open the Edit menu, and select **Remove** to remove the zone from the zone set, or select **Remove from All Zones** to remove the zone from all zone sets.

4. Choose the **Apply** button to save changes to the zoning database.

Alternatively, you may use shortcut menus to remove a zone from a zone set or from all zone sets in the database.

3.4.6.5
Removing a Zone Set

Removing a zone set from the database affects the member zones in the following ways.

■ Member zones that are members of other zone sets are not affected.

■ Member zones that are not members of other zone sets become members of the orphan zone set.

To delete a zone set from the database, do the following:

1. In the faceplate display, open the Zoning menu and select **Edit Zoning** to open the Edit Zoning window.

2. In the Zone Sets tree, select the zone set to be removed.

3. Open the Edit menu, and select **Remove** to remove the zone set.

4. Choose the **Apply** button to save changes to the zoning database.

Alternatively, you may use shortcut menus to remove a zone set from the database.

3.4.6.6

Removing All Zoning Definitions

To clear all zone and zone set definitions from the zoning database, choose one of the following:

■ Open the Edit menu and select **Remove All**. In the Remove All window, choose the **Yes** button to confirm that you want to delete all zones and zone sets.

■ Right-click the Zone Sets heading at the top of the Zone Sets tree, and select **Clear Zoning** from the popup menu. Choose the **Yes** button to confirm that you want to delete all zone sets and zones.

3.4.7

Managing Zones

Managing zones involves the following:

■ Creating a zone in a zone set

■ Adding zone members

■ Renaming a zone or a zone set

■ Removing a zone member

■ Removing a zone from a zone set

■ Removing a zone from all zone sets

■ Changing zone types

Note: Changes that you make to the zoning database behave as follows:

■ In SW2 merge mode, changes to configured zone sets are limited to the managed switch and do not propagate to the rest of the fabric. To distribute changes to configured zone sets fabric wide, you must edit the zoning databases on the individual switches.

■ In Brocade merge mode, when a zone set is activated, the entire zoning database, including any changes, is distributed from the managed switch throughout the fabric.

3.4.7.1

Creating a Zone in a Zone Set

When a zone is created, it's zone type is soft. To change the zone type to a hard zone (ACL or VPF), refer to ”Changing Zone Types” on page 3-25 for more information. Refer to ”Zones” on page 3-10 for information on zone types (soft and hard). To create a zone in a zone set, do the following:

1. Open the Zoning menu, and select **Edit Zoning** to open the Edit Zoning window.

2. Open the Edit menu and select **Create a Zone**.

3. In the Create a Zone window, enter a name for the new zone, and choose the **OK** button. The new zone name is displayed in the Zone Sets window.

   Note: If you enter the name of a zone that already exists in the database, the SANbox Manager application will create a copy of that zone and its membership in the zone set.

4. To add ports or devices to the zone, do one of the following:

   ■ In the zone set tree, select the zone set. In the graphic window, select the port to add to the zone. Open the Edit menu and select **Add Members**.

   ■ Select a port by port number, Fibre Channel address, or worldwide name in the Port/Device tree, and drag it into the zone.

   ■ Select a port by port number, Fibre Channel address, or worldwide name in the Port/Device tree. Right-click the zone and select **Add Zone Members** from the popup menu.

5. Choose the **Apply** button to save changes to the zoning database.

3.4.7.2
Adding Zone Members

Adding a zone member to a zone will affect every zone set in which that zone is a member. To add member ports/devices to a zone, do one of the following:

■ Select a port by port number, Fibre Channel address, or worldwide name in the Port/Device tree, and drag it into the zone. To select and drag multiple ports/devices, press and hold the Control key while dragging.

■ Select one or more ports by port number, Fibre Channel address, or worldwide name in the Port/Device tree. Right-click the zone and select **Add Zone Members** from the popup menu.

Choose the **Apply** button to save changes to the zoning database.

Note: Domain ID conflicts can result in automatic reassignment of switch domain IDs. These reassignments are not reflected in zones that use domain ID/port number pair to define their membership. Be sure to reconfigure zones that are affected by a domain ID change.

3.4.7.3

Renaming a Zone or a Zone Set

To rename a zone, do the following:

1. In the Zone Sets tree of the Edit Zoning window, click the zone/zone set to be renamed.

2. Open the Edit menu and select **Rename**.

3. In the Rename Zone/Rename Zone Set window, enter a new name for the zone/zone set.

4. Choose the **OK** button.

3.4.7.4

Removing a Zone Member

Removing a zone member will affect every zone and zone set in which that zone is a member. To remove a member from a zone:

1. In the Edit Zoning window, select the zone member to be removed.

2. Open the Edit menu and select **Remove**.

3. Choose the **OK** button to save the changes and close the Edit Zoning window.

3.4.7.5

Removing a Zone from a Zone Set

Removing a zone from a zone set will affect every zone set in which that zone is a member. To delete a zone from a zone set:

1. In the Edit Zoning window, select the zone to be removed.

2. Open the Edit menu and select **Remove**.

3. Choose the **OK** button to save the changes and close the Edit Zoning window.

3.4.7.6

Removing a Zone from All Zone Sets

To delete a zone from all zone sets, do the following:

1. In the Edit Zoning window, select the zone to be removed.

2. Open the Edit menu and select **Remove Zone from All Sets**.

3. Choose the **OK** button to save the changes and close the Edit Zoning window.

3.4.7.7
Changing Zone Types

To change a zone type, do the following:

1.   In the faceplate display, select the switch with the zone type to change.

2.   Choose the **Zoning** button to open the Edit Zoning window.

3.   In the Zone Sets tree, select the zone to change.

4.   Open the Edit menu and select **Set Zone Type** to open the Set Zone Type window.

5.   Open the Zone Type pull-down menu and select **Soft**, **VPF** (virtual private fabric), or **ACL** (access control list). Refer to "Soft Zones" on page 3-10, "Access Control List Hard Zones" on page 3-11, or "Virtual Private Fabric Hard Zones" on page 3-11 for a description of these zone types.

3.4.8
Managing Aliases

An alias is a collection of objects that can be zoned together. An alias is not a zone, and can not have a zone or another alias as a member.

Note: Changes that you make to the zoning database behave as follows:

   ■   In SW2 merge mode, changes to configured zone sets are limited to the managed switch and do not propagate to the rest of the fabric. To distribute changes to configured zone sets fabric wide, you must edit the zoning databases on the individual switches.

   ■   In Brocade merge mode, when a zone set is activated, the entire zoning database, including any changes, is distributed from the managed switch throughout the fabric.

3.4.8.1
Creating an Alias

To create an alias, do the following:

1.   Open the Zoning menu, and select **Edit Zoning** to open the Edit Zoning window.

2.   Open the Edit menu, and select **Create Alias** to open the Create Alias window.

3.   Enter a name for the alias, and choose the **OK** button. The alias name is displayed in the Zone Sets window.

4.   Choose the **OK** button to save the alias name to the zoning database.

3.4.8.2
Adding a Member to an Alias

The three ways to add a member to an alias are:

■ Drag-and-drop method.

■ Select the alias in the left pane and the member in the right pane to add to that alias, and choose the **Insert** button.

■ Select the alias in the left pane and the member in the right pane to add to that alias, and open the Edit menu and select **Add Members**.

To add a member to an alias using the drag-and-drop method, do the following:

1. In the right pane, click and hold down the mouse button on the member to be added to the alias.

2. Drag the selected member from the right pane to the alias in the left pane.

To add a member to an alias using the menu options, do the following:

1. Open the Zoning menu, and select **Edit Zoning** to open the Edit Zoning window.

2. In the left pane, select an alias.

3. In the right pane, select the member to add to the selected alias.

4. Choose one of the following:

■ Open the Edit menu and select **Add Members**.

■ Choose the **Insert** button.

5. Choose the **OK** button to save the changes and close the Edit Zoning window.

3.4.8.3
Removing an Alias from All Zones

To remove an alias from all zones, do the following:

1. In the Zone Sets tree in the Edit Zoning window, select the alias to be removed.

2. Open the Edit menu, and select **Remove Alias from All Zones**.

3. Choose the **Yes** button in the Remove window.

Section 4
Managing Switches

This section describes the following tasks that manage switches in the fabric.

■   Displaying switch information

■   Exporting alarm log information to a file

■   Exporting name server information to a file

■   Paging a switch

■   Resetting a switch

■   Configuring a switch

■   Archiving a switch

■   Restoring a switch

■   Loading firmware

■   Restoring the factory default configuration

4.1
Displaying Switch Information

The faceplate display and data windows provide the following specific switch information:

■   Hardware status

■   Name server information

■   Switch specifications and addresses

■   Configuration parameters

■   Performance statistics

■   Configured zone sets

■   Alarm log information
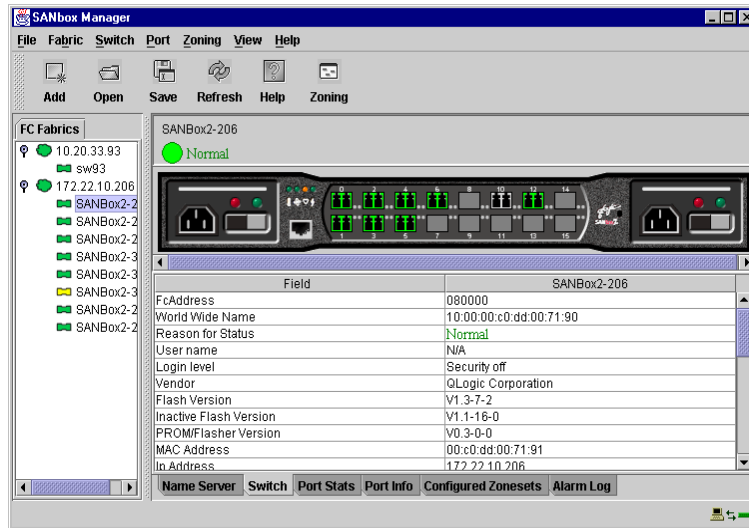
Figure 4-1. Faceplate Display

The fabric updates the topology and faceplate displays by forwarding changes in status to the management workstation as they occur. You can allow the fabric to update the switch status, or you can refresh the display at any time. To refresh switch status in the display, do one of the following:

■ Choose the **Refresh** button.

■ Open the View menu and select **Refresh**.

■ Press the F5 key.

■ Right-click a switch in the topology display and select **Refresh Switch** from the popup menu.

■ Right-click in the graphic window of the faceplate display, and select **Refresh Switch** from the popup menu.

4.1.1
Displaying Hardware Status

A SANbox2 switch is equipped with the following chassis LEDs that provide hardware status information:

■ Chassis Over Temperature LED - indicates air temperature inside the switch.

■ Fan Fail LED - indicates operational status of both fans.

■ Heartbeat LED - indicates the status of the internal switch processor and the results of Power On Self Tests (POSTs).

■ Input Power LED - indicates the voltage status at the switch logic circuitry.

You can display a summary of this status information by placing the cursor on the chassis LED cluster as shown in Figure 4-2. Refer to *SANbox2 Fibre Channel Switch Installer's/User's Manual* for more information about the chassis LEDs.
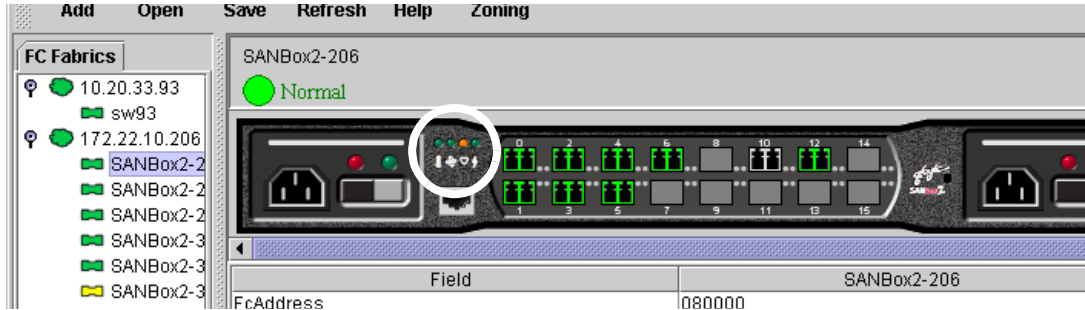
Figure 4-2. Faceplate Display - Chassis LED Cluster

4.1.2
Name Server Data Window

The Name Server data window displays information about the devices logged into the fabric. It is available in both the topology display and the faceplate display. Choose the Name Server tab below the data window to display name server data for the selected fabric. To narrow the display, select on or more switches. Refer to "Name Server Data Window Entries" on page 4-3 for a description of the fields in the Name Server data window. Refer to "Exporting Name Server Information to a File" on page 4-7 to export name server information to a file.

Table 4-1. Name Server Data Window Entries

Entry	Description
Device	Device number in the fabric
Switch	Switch name
Port	Port number (0 - 15)
Address	Fibre Channel address
Type	Node type
WWNN	Worldwide node name
WWPN	Worldwide port name
Vendor	Host Bus Adapter/Device Vendor
FC-4 Types	Device Fibre Channel protocol types

4.1.3

Switch Data Window

The Switch data window displays current network and switch information for the selected switches. Refer to "Configuring a Switch" on page 4-7 for more information about the Switch data window. To open the Switch data window, select one or more switches in the topology display and choose the **Switch** tab below the window. You can also open the Switch data window in the faceplate display. Table 4-2 describes the Switch data window entries.

Table 4-2. Switch Data Window Entries

Entry	Description
FcAddress	Switch Fibre Channel address
World Wide Name	Switch worldwide name
Reason for Status	Additional status information
User Name	Name of user
Login Level	Security level
Vendor	Switch manufacturer
Flash Version	Active Flash
Inactive Flash Version	Inactive firmware version
PROM/Flasher Version	Firmware version
MAC Address	Media Access Control address
IP Address	Internet Protocol Address
Negotiated Domain ID	The domain ID currently being used by the fabric
Configured Domain ID	The domain ID defined by network administrator
Number of Ports	Number of ports on the switch
Switch Type	Switch model
Operational State	Switch operational state: Online, Offline, Diagnostic
Administrative State	Switch administrative state: Online, Offline, Diagnostic
MFS Timeout	Multi frame sequencing timeout value
RA Timeout	Resource allocation timeout value
RT Timeout	Receiver transmitter timeout value

Table 4-2. Switch Data Window Entries (Continued)

Entry	Description
ED Timeout	Error detect timeout value
Zoning Merge Mode	SW2 Standard or Brocade Proprietary
Zoning Merge Auto Save	Whether zoning auto save is on (default) or off
Zoning Default Visibility	Whether zoning visibility is set to All (default) or None
Temperature	Internal switch temperature °C
Fan 1 Status	Fan status
Fan 2 Status	Fan status
Fan 3 Status	Fan status
Power Supply 1 Status	Power supply 1 status
Power Supply 2 Status	Power supply 2 status
Beacon Status	Whether LEDs on the switch are blinking (on or off).
Broadcast Support	Whether broadcast support is enabled or disabled (default).

4.1.4
Port Statistics Data Window

The Port Statistics data window displays port performance data for the selected ports. To open the Port Statistics data window, choose the **Port Stats** tab below the data window in the faceplate display. Refer to Table 5-5 for a description of the Port Statistics data window entries.

The Statistics pull-down menu is available on the Port Statistics data window, and provides different ways to view detailed port information. Choose the down arrow to open the pull-down menu. Open the pull-down menu and select **Absolute** to view the total count of statistics since the last switch reset. Select **Rate** to view the number of statistics counted per second over the polling period. Select **Baseline** to view the total count of statistics since the last time the baseline was set. Choose the **Clear Baseline** button to set the current baseline.

4.1.5
Port Information Data Window

The Port Information data window displays port detail information for the selected ports. To open the Port Statistics data window, choose the **Port Info** tab below the data window in the faceplate display. Refer to Table 5-6 for a description of the Port Information data window entries.

4.1.6

Configured Zonesets Data Window

The Configured Zonesets data window displays all zone sets, zones, and zone membership in the zoning database, as shown in Figure 4-3. To open the Configured Zonesets data window, choose the **Configured Zonesets** tab below the data window in the faceplate display.

The Configured Zonesets data window uses display conventions for expanding and contracting entries that are similar to the fabric tree. An entry handle located to the left of an entry in the tree indicates that the entry can be expanded. Click this handle or double-click the following entries to expand or contract them:

■ A zone set entry expands to show its member zones.

■ A zone entry expands to show its members by port number, worldwide name, or Fibre Channel address.
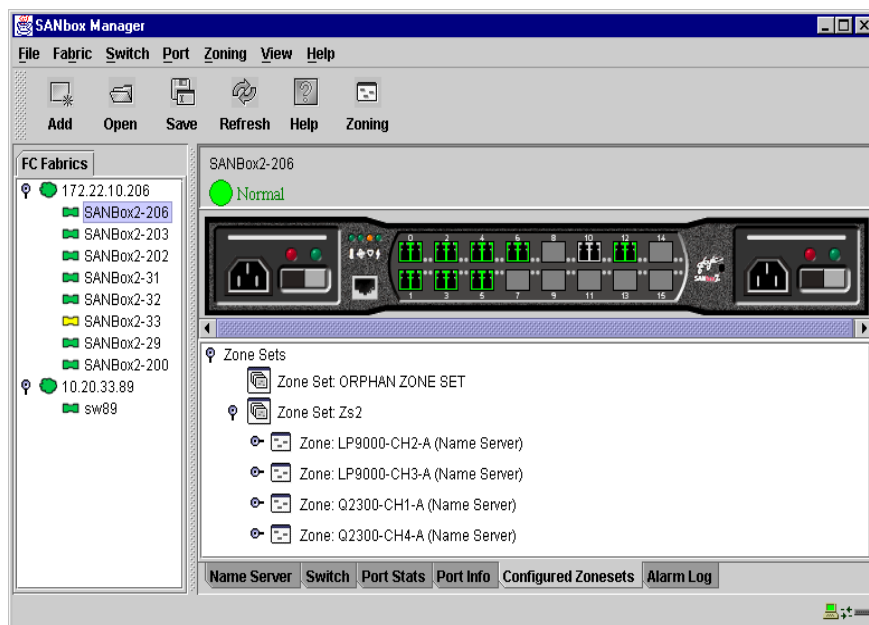
Figure 4-3. Configured Zonesets Data Window

4.1.7

Alarm Log Data Window

The Alarm Log data window displays switch event information. To open the Alarm Log data window, choose the **Alarm Log** tab below the data window in the faceplate display.

4.2
Exporting Alarm Log Information to a File

To save switch alarm log information to file, open the faceplate display and do the following:

1.   Open the Switch menu and select **Export Alarm Log**.

2.   In the Save window, enter a file name.

3.   Choose the **Save** button.

4.3
Exporting Name Server Information to a File

To save switch name server information to file, open the topology display and do the following:

1.   Open the Switch menu and select **Export Name Server**.

2.   In the Save window, enter a file name.

3.   Choose the **Save** button.

4.4
Paging a Switch

You can use the beacon feature to page a switch. The beacon feature causes all port Logged-In LEDs to flash, making it easier to recognize. To page a switch, open the Switch menu in the faceplate display and enable the *Toggle Beacon* selection. To cancel the beacon, reselect **Toggle Beacon**.

4.5
Resetting a Switch

Resetting a switch reboots the switch using configuration parameters in memory. You can reset a switch in the following ways:

■   Select the switch to be reset in the fabric tree. Open the Switch menu and select **Reset Switch**.

■   Turn both power supplies off, then turn one or both of them back on.

4.6
Configuring a Switch

Switch configuration is divided into two areas: chassis configuration and network configuration. Chassis configuration specifies switch-wide Fibre Channel settings. Network configuration specifies Ethernet and SNMP related settings.

To open the Switch Properties window, open the Switch menu and select **Switch Properties**. You may also right-click a switch graphic in the topology display or faceplate display, and select **Switch Properties** from the popup menu.

4.6.1

Switch Configuration

Use the Switch Properties window to change the chassis name, administrative state, domain ID, and to enable or disable broadcast support. Broadcast support provides support for IP broadcast over Fibre Channel. The timeout values are displayed for reference purposes only when the switch is online. These fields become activate when the switch is take offline and then redisplaying the Switch Properties window. After making changes, choose the **OK** button to put the new values into effect.
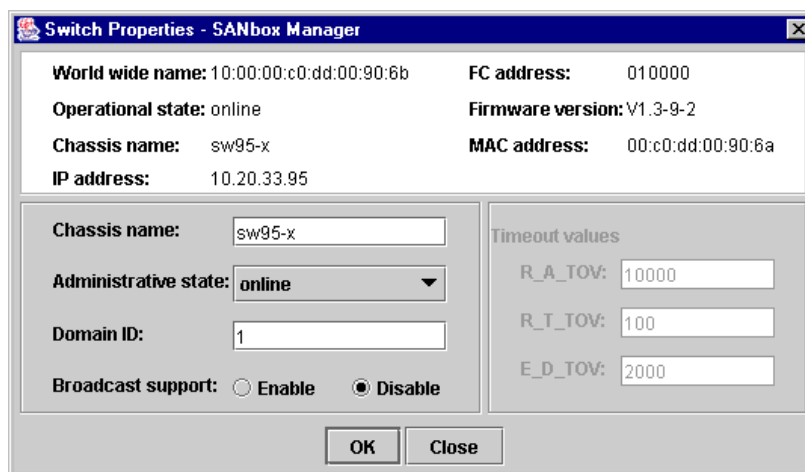
Figure 4-4. Switch Properties Window

4.6.1.1

Chassis Name

A user-defined name that identifies the switch. The default is SANbox2.

4.6.1.2

Switch Administrative States

The switch administrative state specifies the operational status of the switch. Table 4-3 describes the administrative state values. When applied to the switch, the administrative state becomes the operational state.

Table 4-3. Switch Administrative States

Parameter	Description
Online	The switch is available.
Offline	The switch is unavailable.
Test	The switch is in test mode and is unavailable.

4.6.1.3
Domain ID

The domain ID is a unique Fibre Channel identifier for the switch. The Fibre Channel address consists of the domain ID, port ID, and the Arbitrated Loop Physical Address (ALPA). The maximum number of switches within a fabric is 239 with each switch having a unique domain ID.

Switches come from the factory with the domain IDs unlocked (DomainID-Lock= FALSE). This means that if there is a domain ID conflict in the fabric, the switch with the highest principal priority, or the principal switch, will reassign any domain ID conflicts and establish the fabric. If you lock the domain ID on a switch (DomainIDLock=TRUE) and a domain ID conflict occurs, the switch with the higher WWN will isolate as a separate fabric and the Logged-In LEDs on both switches will flash to show the affected ports. Refer to the "Set Config Command" on page A-24 for information about the Switch keyword and the DomainIDLock and PrincipalPriority parameters.

If you connect a new switch to an existing fabric with its domain ID unlocked, and a domain conflict occurs, the new switch will isolate as a separate fabric. However, you can remedy this by resetting the new switch or taking it offline then back online. The principal switch will reassign the domain ID and the switch will join the fabric.

Note: Domain ID reassignment is not reflected in zoning that is defined by domain ID and port number pair. You must reconfigure zones that are affected by domain ID reassignment.

4.6.1.4
Broadcast Support

Broadcast is supported on the SANbox2 which allows for IP-over-Fibre Channel support support. Broadcast is implemented using the proposed standard specified in *Multi-Switch Broadcast for FC-SW-3, T11 Presentation Number T11/02-031v0.* FSPF is used to setup a fabric spanning tree used in transmission of broadcast frames. Broadcast frames are retransmitted on all ISLs indicated in the spanning tree and all online F/FL ports. Broadcast zoning is supported with Access Control List (ACL) and Virtual Private Fabric (VPF) hard zones. When a broadcast frame is received, these hard zones are enforced at the F/FL port. If the originator of the broadcast is in a hard zone, the frame is retransmitted on all online F/FL ports within the hard zone. If the originator of the broadcast frame is not in a hard zone, the frame is retransmitted on online F/FL ports that are not in a hard zone.

4.6.1.5
Timeout Values

The switch timeout values determine the timeout values for all ports on the switch. Table 4-4 describes the switch timeout parameters. The R_A_TOV, R_T_TOV, or E_D_TOV values must be the same for all switches in the fabric.

Note: Timeout values can only be changed if the switch operational state is offline.

Table 4-4. Timeout Values

Parameter	Description
R_A_TOV	Resource Allocation Timeout. The maximum amount of time a frame could be delayed in the fabric and still be delivered. The default is 10000 milliseconds.
R_T_TOV	Receiver Transmitter Timeout. The amount of time that synchonization may be lost between two ports before link failure is detected. The default is 100 milliseconds.
E_D_TOV	Error Detect Timeout. The maximum round trip time that an operation between two N_Ports could require. The default is 2000 milliseconds.

4.6.2

Network Configuration

Use the Network Properties window shown in Figure 4-5 to change IP and SNMP configuration parameters. After making changes, choose the **OK** button to put the new values into effect. To open the Network Properties window, open the Switch menu and select **Network Properties**.

Note: Since Read Community, Trap Community, and Write Community settings are like passwords, they are write-only fields; the current settings are not displayed.

Figure 4-5. Network Properties Window

IP Configuration

The IP configuration identifies the switch on the Ethernet network and determines which boot method to use. Table 4-5 describes the IP configuration parameters.

Table 4-5. IP Configuration Parameters

Parameter	Description
IP Address	Internet Protocol (IP) address for the Ethernet port. The default and PROM mode value is 10.0.0.1.
Subnet mask	Subnet mask address for the Ethernet port. The default and PROM mode value is 255.0.0.0.
Boot Method	Choose one of the following methods: ■ Static - Uses the IP configuration parameters entered in the Switch Properties window. ■ BootP - Acquires the IP configuration from a BootP server. ■ RARP (Reverse Address Resolution Protocol) - Acquires the IP address from an RARP server. A RARP request is broadcast, with up to three retries, each at 5 second intervals. If no IP address is obtained, the switch reverts to the previously configured IP address. ■ DHCP (Dynamic Host Configuration Protocol) - Acquires the IP configuration from a DHCP server. If no satisfactory lease is obtained, the DHCP client attempts to use the previously configured lease. If the previous lease cannot be used, no IP address will be assigned to this switch in order to avoid an IP address conflict. The DHCP server must then be made available. If a BootP, RARP, or DHCP server is not available, the switch will boot. However, you will be unable to manage the switch through the Ethernet connection. To manage a switch under these circumstances, the connection must be made through the serial port or inband from another switch.
Gateway	IP gateway address. The default and PROM mode value is 10.0.0.254.

4.6.2.2
Remote Logging

The Remote Logging (syslog) feature enables saving of the log information to a remote host that supports the syslog protocol. When enabled, the log entries are sent to the syslog host at the IP address that you specify in the Logging Host IP Address field. Log entries are saved in the internal switch log whether this feature is enabled or not.

To save log information to a remote host, you must edit the syslog.conf file and then restart the syslog daemon. The syslog.conf file on the remote host must contain an entry that specifies the name of the log file in which to save error messages. Add the following line to the syslog.conf file. A <tab> separates the selector field (local0.info) and action field which contains the log file path name (/var/adm/messages/messages.name).

```
local0.info <tab> /var/adm/messages.name
```

4.6.2.3
SNMP Configuration

The SNMP configuration defines how authentication traps are managed. Table 4-6 describes the SNMP configuration parameters.

Table 4-6. SNMP Configuration Parameters

Parameter	Description
Contact	Specifies the name of the contact person who is to be contacted to respond to trap events. The default is undefined.
Read Community	Read Community Authentication. A write-only field; the value on the switch and the SNMP management server must be the same. The default value is Public.
Trap Community	Trap Community Authentication. A write-only field; the value on the switch and the SNMP management server must be the same. The default value is Public.
Location	Specifies the switch location. The default is undefined.
Authentication Trap	Enables or disables the reporting of SNMP authentication failures. If enabled, a notification trap is sent to the configured trap addresses in the event of an authentication failure if incorrect community string values are used. The default value is False.
Write Community	Write Community Authentication. A write-only field; the value on the switch and the SNMP management server must be the same. The default value is Private.

4.6.2.4
SNMP Trap Configuration

The SNMP trap configuration defines how traps are sent. Table 4-7 describes the SNMP configuration parameters.

Table 4-7. SNMP Trap Configuration Parameters

Parameter	Description
Trap Enabled	Check box to enable or disable the trap.
Trap Address	Specifies the IP address to which SNMP traps are sent. The default is 127.0.0.1. A maximum of 5 trap addresses are supported.
Trap Port	The port number on which the trap is set.
Trap Severity	Specifies a severity level to assign to the trap. Open the pull-down menu and choose a level. Traps must be enabled to access this pull-down menu. Trap severity levels include Unknown, Emergency, Alert, Critical, Error, Warning, Notify, Info, Debug, and Mark

4.6.3
Configuration Backup

Changes made to the switch since it was manufactured can be saved to a file in non-volatile memory. However the backup is lost if the switch is reset. Use the FTP User Images procedures to save the *configdata* file to the workstation. (In FTP, no directory listing is available. The configuration backup file is always named *configdata*.) Refer to the "Config Command" on page A-7 for more information. Refer to "Archiving a Switch" on page 4-15.

4.6.4
Configuration Restore

Switch configurations can be "cloned" to easily propagate an identical configuration to other switches. Use the FTP User Images procedures with the Put command to send the previously saved (using config backup) *configdata* file to the switch. Use the Config Restore command to return the switch configuration to the previously saved configuration. The switch is automatically reset upon a successful restore. Refer to the "Config Command" on page A-7 for more information. Refer to "Restoring a Switch" on page 4-16.

4.6.5
Reinitializing the Configuration File System

If the Heartbeat LED on the switch is the 4-blink pattern, the configuration file system may be corrupted. To recover the previous switch configuration, use the Config Restore command. The Heartbeat LED 4-blink pattern continues until a previous switch configuration is successfully restored. The Heartbeat LED is not reflected in the SANbox Manager.

4.7
Archiving a Switch

You can create an .XML archive file containing the configuration parameters. Archived parameters include the following:

■ Switch properties and statistics

■ IP configuration

■ SNMP configuration

■ Port properties and statistics

■ Zoning configuration

This archive file can be used to restore the configuration on the same switch or on a replacement switch. You can also use the archive file as a template for configurring new switches to add to a fabric. Security settings and user account information are not archived. The archive can be used later to restore the switch. Refer to for more information. To archive a switch, do the following:

1. Open the Switch menu and select **Archive**.

2. In the Save window, enter a file name.

3. Choose the **Save** button.

4.8
Restoring a Switch

Restoring a switch loads the archived switch configuration parameters to the switch. The switch configuration **must be archived before** it can be restored. Refer to "Archiving a Switch" on page 4-15 for more information.

It is good practice to archive and restore configurations from like switches. This means restoring a SANbox2-16 switch with a SANbox2-16 archive file, or restoring a SANbox2-8c with a SANbox2-8c archive file. If it is necessary to restore a switch with a dissimilar archive file, consider the following:

■ If you restore a SANbox2-8c switch with a SANbox2-16 archive file, the configuration for ports 0-7 on the SANbox2-8c switch will be restored. Archive information for ports 8-15 will be ignored.

■ If you restore a SANbox2-16 switch with a SANbox2-8c archive file, the configuration for ports 0-7 on the SANbox2-16 switch will be restored. Ports 8-15 wil be unchanged.

The Restore menu item is not available for the inband switches. You can only restore a switch out-of-band (the fabric management switch). To restore a switch, do the following:

1. Open the Switch menu and select **Restore**.

2. In the Restore window, enter the switch configuration file name or browse for the file.

3. Choose the **Restore** button.

4.9
Loading Firmware

The switch does not have to offline to download firmware. However, the switch must be reset to activate the new firmware, which does require admin authority. SANbox Manager will prompt you to reset the switch after the firmware is loaded. The To load firmware to a switch, do the following:

1. In the faceplate display, open the Switch menu and select **Load Firmware***.

2. In the Firmware Upload window, choose the **Select** button to browse and select the firmware file to be uploaded.

3. Choose the **Start** button to begin the firmware load process.

4. When the loading is complete, choose the **Close** button to close the Firmware Upload window.

5. The application prompts you to reset the switch. Choose the **OK** button to reset the switch and implement the new firmware.

4.10

Restoring the Factory Default Configuration

You can restore the switch and port configuration settings to the factory default values. To restore the factory configuration on a switch, open the Switch menu and select **Restore Factory Defaults**. Table 4-8 lists the factory default switch configuration settings. Restoring the switch to the factory default configuration does not restore the account name and password settings. You must use the **Reset Password File** button in the Force PROM Mode screen. Refer to Recovering a Switch section in the *SANbox2-8c Fibre Channel Switch Installation Guide* or *SANbox2 Fibre Channel Switch Installer's/User's Manual*.

Table 4-8. Factory Default Configuration Settings

Setting	Value
Chassis name	SANbox2
Administrative state	Online
Domain ID	1
Resource Allocation Timeout (RA TOV)	10000 milliseconds
Receiver Transmitter Timeout (RT TOV)	100 milliseconds
Error Detect Timeout (ED TOV)	2000 milliseconds
IP address	10.0.0.1
Subnet mask address	255.0.0.0
Gateway address	10.0.0.254
Boot method	Static
Contact	Undefined
Location	Undefined
Trap address	127.0.0.1
Trap community	Public
Read community	Public
Write community	Private
Port state	Online
Port speed	Auto-detect
Port mode	GL

Notes

Section 5
Managing Ports

This section describes the following tasks that manage ports and devices:

■ Displaying port information

■ Configuring ports

■ Testing Ports

5.1
Displaying Port Information

Port information is available primarily in the faceplate display shown in Figure 5-1. The faceplate display data windows provide information and statistics for switches and ports. Use the topology display to show the status information for links between switches.
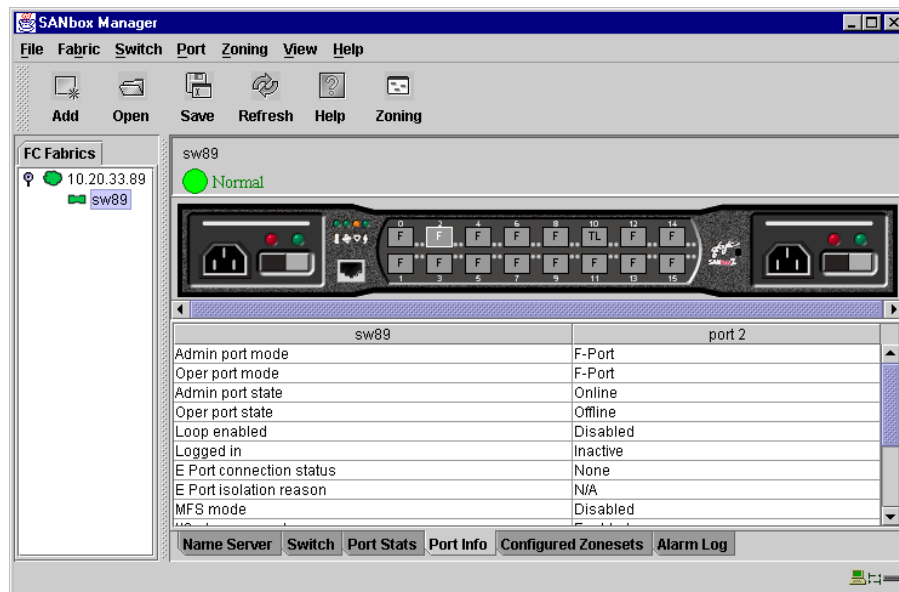
Figure 5-1. Faceplate Display - Port Information

5.1.1

Monitoring Port Status

The faceplate display provides the following port related information:

- Port mode

- Port operational state

- Port speed

- Port media

To display port number and status information for a port, position the cursor over a port on the faceplate display. The status information changes depending on the View menu option selected.

5.1.1.1

Displaying Port Modes

To display port mode status, from the faceplate display, open the View menu, and select **View Port Modes**. Table 5-1 lists the possible port modes and their meanings.

Table 5-1. Port Modes

Mode	Description
F	Fabric port
FL	Fabric loop port
TL	Translated loop port
G	Generic port
GL	Generic fabric loop port
E	Expansion port
D	Donor port

5.1.1.2
Displaying Port Operational States

To display the operational state on each port in the faceplate display, open the View menu and select **View Port States**. Table 5-2 lists the possible operational states and their meanings. The port operational state refers to actual port state and not the administrative state you may have assigned.

Table 5-2. Port Operational States

State	Description
On	Online - port is active and ready to send data.
Ia	Inactive - port operational state is offline, but administrative state is online.
Off	Offline - port is active, can receive signal, but cannot accept a device login.
Tst	Test - port is active and being tested.
Dn	Down – the port is inactive or shut off, not receiving a signal, and can't be logged in.

5.1.1.3
Displaying Port Speeds

To display the speed of each port in the faceplate display, open the View menu and select **View Port Speeds**. Table 5-3 lists the possible speeds.

Table 5-3. Port Speeds

State	Description
1Gb	A 1 Gbps transmission speed.
2Gb	A 2 Gbps transmission speed.

5.1.1.4
Displaying Tranceiver Media Status

To display transceiver media status, open the View menu and select **View Port Media**. Table 5-2 lists the possible media states and their meanings.

Table 5-4. Transceiver Media View

Media Icon	Description
	Optical SFP, Online (Green)
	Optical SFP, Offline (Gray)
None	Empty port, no transceiver installed

5.1.2
Port Statistics Data Window

The Port Statistics data window displays statistics about port performance. To open the Port Statistics window, select one or more ports in the faceplate display and choose the **Port Statistics** tab below the data window. Table 5-5 describes the Port Statistics data window entries.

The Statistics pull-down menu is available on the Port Statistics data window, and provides different ways to view detailed port information. Choose the down arrow to open the pull-down menu. Open the pull-down menu and select **Absolute** to view the total count of statistics since the last switch reset. Select **Rate** to view the number of statistics counted per second over the polling period. Select **Baseline** to view the total count of statistics since the last time the baseline was set. When viewing baseline statistics, choose the **Clear Baseline** button to set the current baseline.

Table 5-5. Port Statistics Data Window Entries

Entry	Description
Start Time	The beginning of the period over which the statistics apply. The start time for the Absolute view is not applicable. The start time for the Rate view is the beginning of polling interval. The start time for the Baseline view is the last time the baseline was set.
End Time	The last time the statistics were updated on the display.
Total Time	Total time period from start time to end time.
Login Count	Number of logins that have occurred on the switch.

Table 5-5. Port Statistics Data Window Entries (Continued)

Entry	Description
Logout Count	Number of logouts that have occurred on the switch.
AI Init Count	Number of times the port entered the initialization state.
Invalid Destination Address	Number of address identifiers (S_ID, D_ID) found to be in error.
Total LIP Received	Number of loop initialization primative frames received.
LIP F7F7 Count	A loop initialization primative frame used to acquire an AL_PA.
LIP F8F7 Count	Currently not used.
LIP F7AIPs Count	This LIP is used to reinitialize the loop. An L_port, identified by AL_PS, may have noticed a performance degradation and is trying to restore the loop.
LIP F8AIPs Count	This LIP denotes a loop failure detected by the L_port identified by AL_PS.
LIP AIPdAIPs Count	Number of F7, AL_PS LIPs, or AL_PD (vendor specific) resets, performed.
Class 2 In Frames	Number of class 2 frames received by this port.
Class 2 Out Frames	Number of class 2 frames transmitted by this port.
Class 2 Words In	Number of class 2 words received by this port.
Class 2 Words Out	Number of class 2 words transmitted by this port.
Class 3 In Frames	Number of class 3 frames received by this port.
Class 3 Out Frames	Number of class 3 frames transmitted by this port.
Class 3 Words In	Number of class 3 words received by this port.
Class 3 Words Out	Number of class 3 words transmitted by this port.
Decode Error Count	Number of invalid transmission words detected during decoding. Decoding is from the 10-bit characters and special K characters.
Loss Of Sync Count	Number of synchronization losses (>100 ms) detected by this port. A loss of synchronization is detected by receipt of an invalid transmission word.
Invalid CRC Count	Number of invalid Cyclic Redundancy Check (CRC) frames detected.
Tx Wait Count	Number of times the port entered a wait state because it was out of buffer-to-buffer credits.

Table 5-5. Port Statistics Data Window Entries (Continued)

Entry	Description
Class 3 Toss Count	Number of class 2 and class 3 sequences that were discarded by this port. A sequence can be discarded because of detection of a missing frame (based on SEQ_CNT), detection of an E_D_TOV timeout, receiving a reject frame, receiving frames for a stopped sequence, or other causes.
FReject Count	Number of frames, from devices, that have been rejected. Frames can be rejected for any of a large number of reasons.
FBusy Count	Number of class 2 and class 3 fabric busy (F_BSY) frames generated by this port in response to incoming frames. This usually indicates a busy condition on the fabric or N_port that is preventing delivery of this frame.
Link Failures	Number of optical link failures detected by this port. A link failure is a loss of synchronization for a period of time greater than the value of R_T_TOV or by loss of signal while not in the offline state. A loss of signal causes the switch to attempt to re-establish the link. If the link is not re-established by the time specified by R_T_TOV, a link failure is counted. A link reset is performed after a link failure.
Primitive Sequence Errors	Number of bad primitives received by the port.
Rx Link Resets	Number of link reset primatives received from an attached device.
Tx Link Resets	Number of link reset primatives sent from this port to an attached port.
Rx Offline Sequences	Number of offline sequence primitives received by the port.
Tx Offline Sequences	Number of offline primitives transmitted by the port.
Total Errors	Total number of primitive and non-primitive port link errors.
Total Tx Frames	Total number of frames transmitted by the port.
Total Rx Frames	Total number of frames received by the port.
Total Tx Words	Total number of words transmitted by the port.
Total Rx Words	Total number of words received by the port.
Total Link Resets	Number of link-reset primitives the transmitted by the port.
Total Offline Sequences	Total number of offline sequences transmitted and received by the port.

5.1.3
Port Information Data Window

The Port Information data window displays port detail information for the selected port. To open the Port Information data window, choose the **Port Info** tab below the data window in the faceplate display.

Table 5-6. Port Info Data Window Entries

Entry	Description
Admin Port Mode	The port mode before auto-configuration occurs.
Oper Port Mode	The current port mode.
Admin Port State	The port state before auto-configuration occurs.
Oper Port State	The current port state.
Loop Enabled	A setting to allow arbitrated loop configuration.
Logged In	Indicates whether logged in or not.
E Port Connection Status	Whether E Port connection is enabled.
E Port Isolation Status	Why E Port is isolated.
MFS Mode	Port tuning indicator.
I/O Stream Guard	Whether RSCN suppression is enabled or disabled.
Admin Port Speed	The speed requested by the user.
Oper Port Speed	The speed actually being used by the port.
TLMode	Indicates if TL target or TL initiator is being used.
BB Credits	Whether buffer-to-buffer credits have been set.
Ext Credits Requested	Whether extended credits have been requested for ports.
Medium	The transceiver type.

5.1.4
Name Server Data Window

The Name Server data window displays information about the port and the connected device. To open the Name Server data window, select one or more switches in the topology display and choose the **Name Server** tab below the data window. You can also open the Name Server data window in the faceplate display. Refer to Table 4-1 for a description of the Name Server data window entries.

5.2
Configuring Ports

The port settings or characteristics are configured using the Port Properties window shown in Figure 5-2. To open the Port Properties window, select one or more ports, open the Port menu and select **Port Properties**.
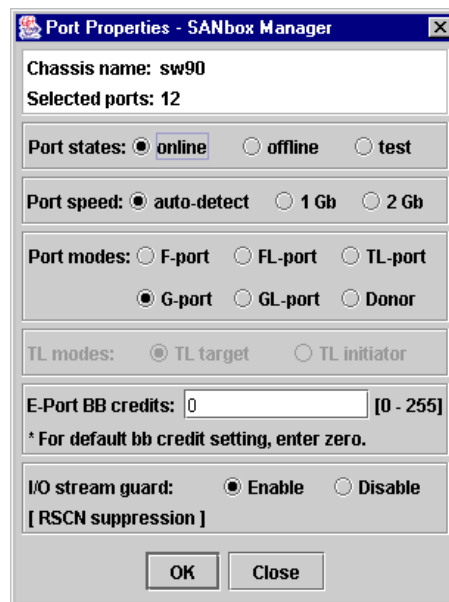
Figure 5-2. Port Properties Window

The Port Properties window displays the switch name and the selected port(s). Use the Port Properties window to change the following parameters:

■   Port state

■   Port speed

■   Port mode

■   TL mode

■   Port buffer credits

■   I/O Stream Guard (RSCN Suppression)

5.2.1

Changing Port Administrative States

The port administrative state determines the port operational state. The port administrative state refers to the requested state in the SANbox Manager application or through the CLI; the port operational state refers to the state actually being used by the port. Table 5-7 describes the port administrative states. To change port administrative state, do the following:

1. Select one or more ports in the faceplate display.

2. Open the Port menu and select **Port Properties** to open the Port Properties window.

3. Choose the **Port States** radio button for the the port state you want.

4. Choose the **OK** button to write the new port state to the switch.

Table 5-7. Port Administrative States

State	Description
Online	Activates and prepares port to send data.
Offline	Permits port to remain active, but prevents port from receiving signal and accepting a device login.
Test	Permits port to remain active, but prepares port for testing.

5.2.2

Changing Port Speeds

The SANbox2 switch ports are capable of transmitting and receiving at 1 or 2 Gbps. The ports can be configured for either transmission speed or to sense the transmission speed of the device to which it is connected. Table 5-8 describes the port speeds. To change the port speed, do the following:

1. Select one or more ports in the faceplate display.

2. Open the Port menu and select **Port Properties**.

3. Choose the radio button that corresponds to the port speed you want.

4. Choose the **Apply** button to write the new port speed to the switch.

Table 5-8. Port Speeds

State	Description
Auto-Detect	Matches the transmission speed of the connected device. This is the default.
1Gb	Sets the transmission speed to 1 Gbps.
2Gb	Sets the transmission speed to 2 Gbps.

5.2.3
Changing Port Modes

The SANbox2 switch ports support both public and private devices as single devices or in loops. The ports can be configured to self-discover the proper mode to match the device or switch to which it is connected. Table 5-9 describes the port modes. To change the port mode, do the following:

1.   Select one or more ports in the faceplate display.

2.   Open the Port menu and select **Port Properties** to open the Port Properties window.

3.   Choose the **Port Modes** radio button that corresponds to the port mode you want.

4.   Choose the **OK** button to write the new port mode to the switch.

Table 5-9. Port Modes

State	Description
F_Port	Fabric port - Supports a single public device (N_Port).
FL_Port	Fabric loop port - Supports a loop of up to 126 public devices (NL_Port).
TL_Port	Translated loop port - Supports a loop of up to 126 private target or initiator devices capable of communicating with up to 63 public or private devices on other ports. Refer to the Installation Guide for your switch for more information about TL_Ports.
G_Port	Generic port - Self discovers as an F_Port or an E_Port.
GL_Port	Generic loop port - Self discovers as an F_Port, FL_Port, or an E_Port.
Donor	Donor port - Allows buffer credits to used by another port.

5.2.4
Changing TL Modes

You can configure a TL_Port to support a loop of private target devices or a loop of private initiator devices.

■ For a loop of private target devices, choose the **TL Target** radio button. This enables up to 63 initiator devices anywhere in the fabric to automatically connect with the private devices on the TL_Port. Use zoning to limit the number of possible initiators to 63.

■ For a loop of private initiator devices, choose the **TL Initiator** radio button. This enables the private initiators on the TL_Port to automatically connect to up to 63 target devices. The TL_Port initiator devices and the target devices must be members of the same soft zone.

5.2.5
Changing Buffer-to-Buffer Credits

Each SANbox2 port has a receive buffer capacity of 12 Fibre Channel frames or credits which is equal to approximately 24K bytes. Port buffer credits can be changed on ports to accommodate connections to non-SANbox2 switches that have different port buffer capacities. To change port buffer credits, do the following:

1. Select one or more ports in the faceplate display.

2. Open the Port menu and select **Port Properties**.

3. In the E_Port BB Credits field, enter the new number.

4. Choose the **OK** button to write the new buffer-to-buffer setting to the switch.

5.2.6
I/O Stream Guard

The I/O Stream Guard feature suppresses Registered State Control Notification (RSCN) messages on a port basis.

5.2.7
Extending Port Credits

Each port is supported by a data buffer with a 12 credit capacity; that is, 12 maximum sized frames. For fibre optic cables, this enables full bandwidth class 2 service over a distance of 20 kilometers at 1 Gbps (0.6 credits/Km), or 10 kilometers at 2 Gbps (1.2 credits/Km). Longer distances can be spanned at full bandwidth by borrowing credits from designated donor ports thus pooling the buffer capacities. This is called credit extension. Each donor port contributes 11 credits to the pool from which the recipient ports can draw. For example, one donor port contributes 11 credits to the pool from which a recipient draws for a total of 23 credits (11+12). This provides approximately 38 Km at 1 Gbps (23÷0.6) or 19 Km at 2 Gbps (23÷1.2).

To extend port buffer credits, do the following:

1. In the faceplate display, select the ports that are to serve as donor ports. Open the Port menu and select **Port Properties**. In the Port Properties window, choose the **Donor** radio button and choose **OK**.

   Note: Donor ports are incapable of transmitting or receiving data.

2. In the faceplate display, select the recipient ports. Recipient ports must be configured as G_Ports or F_Ports. Open the Port menu and select **Extended Credits**. This opens the Extended Credits window shown in Figure 5-3.

3. Distribute the borrowed credits by incrementing the **Ext Credits Requested** field for the recipient ports up to the total credits in the pool. If you exceed this total, some recipient ports will not receive the requested credits. Choose **OK**.

   Note: As credits are used, the Logged-In LEDs on the corresponding donor ports illuminate continuously. In addition, donor port Activity LEDs will reflect the same traffic as the recipient port. Donor ports whose credits are being used are unavailable to devices that are connected to them.

Extended Credits - SANbox Manager

World wide name: 10:00:00:c0:dd:00:90:ae   FC address: 040000

Chassis name: 93x   IP address: 10.20.33.93

Port Number	Config Port Mode	Ext Credits Requested	Max Credits Available	Donated to Port
0	F	22	34	None
1	F	0	12	None
2	F	11	23	None
3	F	0	12	None
4	F	11	23	None
5	F	0	12	None
6	F	0	12	None
7	F	0	12	None
8	F	0	12	None
9	F	0	12	None
10	F	0	12	None
11	F	0	12	None
12	Donor	0	11	None
13	Donor	0	11	None
14	Donor	0	11	None
15	Donor	0	11	None

Credit pool: 44

Ok   Close

Figure 5-3. Extended Credits Window

5.2.8
Resetting a Port

The Reset Port option reinitializes the port using configuration parameters in memory. To reset a port, do the following:

1. In the Faceplate Display, select the port(s) to be reset.

2. Open the Port menu and select **Reset Port**.

5.3
Testing Ports

The port loopback tests verify correct port operation by sending a frame out through the loop, and then verifying that the frame received matches the frame that was sent. Only one port can be tested at a time for each type of test. The three types of port loopback tests are:

■ **SerDes level (Internal)** - The SerDes level test verifies port circuitry. The SerDes level test sends a test frame from the ASIC through the SerDes chip and back to the ASIC for the selected ports. The port passes the test if the frame that was sent by the ASIC matches the test frame that was received.

■ **SFP level (External)** - The SFP level test also verifies port circuitry. The SFP level test sends a test frame from the ASIC through the SerDes chip, through the SFP transceiver fitted with a loopback plug, and back to the ASIC for the selected ports. The port passes the test if the test frame that was sent by the ASIC matches the test frame that was received.

■ **Node-to-Node (Online)** - The Node-to-Node test verifies communications between the port and its device node or device loop. The port being tested must be online and connected to a remote device. The port passes the test if the test frame that was sent matches the test frame that was received.
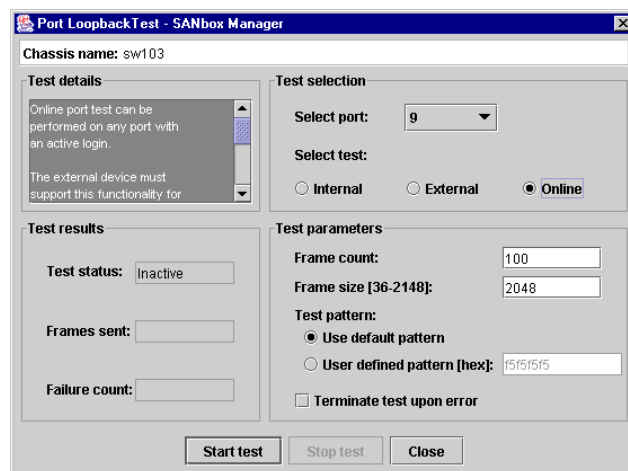
Figure 5-4. Port Loopback Test Window

Note: The SerDes (Internal) and SFP (External) level tests disrupt communication on the selected port. The Node-to-Node (Online) level test does not disrupt communication, because the requires that the port be online.

To run the Internal, External, or Online port loopback test on a port, do the following:

1. In the faceplate display, select the port to be tested.

2. Open the Port menu and select **Port Loopback Test** to open the Port Loopback Test window.

3. In the Test Selection area, choose the radio button for the type of loopback test (Internal, External, or Online) to be run.

   ■ If you choose the Internal or External test, SANbox Manager will prompt you to confirm that the state of the port being tested needs to be changed to the Test (diagnostic) state in order to run the test. Choose the **OK** button and SANbox Manager will change the port state. In the Port Loopback Test window, choose the **Start Test** button to begin the test.

   ■ If you choose the Online test, the fields in the Test Parameters area are activated. Enter the frame count, frame size, and choose a test pattern radio button. You may use the default pattern or enter a user-specified pattern (hex). Check the **Terminate Test Upon Error** box if you want the test to stop when encountering an error. Choose the **Start Test** button to begin the test.

4. The Test Results area displays the test status, number of frames sent, and number of errors found.

5. To test another port, open the Select Port pull-down menu and select another port (number) and test type (Internal, External, or Online) in the Test Selection area.

6. Choose the **Start Test** button to begin the next test. Observe the results in the Test Results area.

Appendix A

Command Line Interface

Each SANbox2 switch contains a Telnet server. This server allows a Telnet client to establish a Telnet session with the switch to retrieve information or to configure parameters. The Command Line Interface enables you to perform a variety of fabric and switch management tasks through an Ethernet or a serial port connection to a switch.

A.1
Logging On to a Switch

To log on to a switch using Telnet, open a command line window on the management workstation and enter the Telnet command followed by the switch IP address:

```
/> telnet 123.45.67.890
```

A Telnet window opens prompting you for a SANbox2 login. Enter an account name and password. Switches come from the factory with the following user account already defined:

> Account name: admin
> Password: password
> Authority: Admin

This user account provides full access to the switch and its configuration. After planning your fabric management needs and creating your own user accounts, consider changing the password for this account. Refer to "Commands" on page A-3 for more information about authority levels. Refer to the "User Command" on page A-59 for information about creating and deleting user accounts.

> *Note:*   The switch supports a combined maximum of 15 logins. This includes SANbox Manager inband and out-of-band logins, Telnet out-of-band logins, and SNMP out-of-band logins. Additional logins will be refused.

A.2
Command Syntax

The command syntax is as follows:

command
    <u>key</u>word
    keyword *[value]*
    keyword [value1] [value2]

The **Command** is followed by one or more keywords. Consider the following rules and conventions:

■   Commands and keywords are lowercase and case sensitive.

■   Commands with keywords require one of those keywords.

■   Required keyword values appear in standard font: [value]. Optional values are shown in italics: *[value]*.

■   Underlined portions of the keyword in the command format indicate the abbreviated form that can be used. For example the <u>Del</u>ete keyword can be abbreviated Del.

A.3
Commands

The command set provides for User and Admin authority levels.

■ User authority grants viewing access to the fabric and switches using the Show command and other read-only commands.

■ Admin authority includes the User authority and grants permission to use the Admin command. The Admin Start command opens an admin session which provides access to the commands that change switch and fabric configurations. Refer to the "Admin Command" on page A-4.

Note: Admin authority is enforced only if fabric security is enabled on the switch. By default, fabric security is disabled. Refer to the System keyword of the "Set Setup Command" on page A-34 for information about setting fabric security.

The commands and their page numbers are listed by authority level in Table A-1.

Table A-1. Commands Listed by Authority Level

User Authority Commands		Admin Authority Command	
Date	(A-9)	Admin	(A-4)
Help	(A-11)	**Admin Session Commands**	
History	(A-12)		
Ps	(A-16)	Alias[1]	(A-5)
Quit	(A-17)	Config[1]	(A-7)
Set Beacon	(A-23)	Fallback	(A-10)
Show	(A-39)	Image	(A-13)
Show Config	(A-48)	Lip	(A-14)
Show Log	(A-50)	Passwd	(A-15)
Show Perf	(A-52)	Reset	(A-18)
Show Setup	(A-53)	Set Alarm Clear	(A-22)
Uptime	(A-58)	Set Config	(A-24)
Whoami	(A-61)	Set Log	(A-30)
		Set Port	(A-33)
		Set Setup	(A-34)
		Set Switch	(A-38)
		Shutdown	(A-55)
		Test	(A-56)
		User[1]	(A-59)
		Zone[1]	(A-62)
		Zoneset[1]	(A-65)
		Zoning[1]	(A-67)

[1]Some keywords are available with User authority outsiide of an admin session.

Admin Command

Opens and closes an Admin session granting Admin authority. The Admin session provides commands that change the fabric and switch configurations. Only one Admin session can be open in the fabric at any time. An inactive Admin session will time out after a period of time which can be changed using the Set Setup System command. Refer to the Set Setup Command on page A-34.

Authority   Admin

Syntax   **admin**
        start
        end
        cancel

Keywords   **start**
Opens the Admin session.

end
Closes the Admin session.

cancel
Terminates an Admin session opened by another user. Use this keyword with care because it terminates the Admin session without warning the other user and without saving pending changes.

Examples   The following example shows how to open and close an Admin session:

```
SANbox2 $> admin start


SANbox2 (admin) #>


.
.
.


SANbox2 (admin) #> admin end
SANbox2 #>
```

Alias Command

Creates a named set of ports. Aliases make it easier to assign a set of ports to many zones. An alias can not have a zone or another alias as a member.

Authority Admin

Syntax **alias**
add [alias] [members]
copy [alias_source] [alias_destination]
create [alias]
<u>del</u>ete [alias]
list
members [alias]
remove [alias] [members]
rename [alias_old] [alias_new]

Keywords **add [alias] [members]**
Specifies one or more ports given by [members] to add to the alias named [alias]. [members] can have one of the following formats:

■ Domain ID and port number pair (Domain ID, Port Number). Domain IDs and port numbers are in decimal. Ports are numbered beginning with 0.

■ 6-character device Fibre Channel address (hex)

■ 16-character hexadecimal worldwide port name (WWPN) with the format xx:xx:xx:xx:xx:xx:xx:xx.

The application verifies that the [alias] format is correct, but does not validate that such a port/device exists.

copy [alias_source] [alias_destination]
Creates a new alias named [alias_destination] and copies the membership into it from the alias given by [alias_source].

create [alias]
Creates an alias with the name given by [alias]. The alias name can have a maximum of 64 characters.

<u>del</u>ete [alias]
Deletes the specified alias given by [alias] from the zoning database. If the alias is a member of the active zone set, the alias will not be removed from the active zone set until the active zone set is deactivated.

list
Displays a list of all aliases. This keyword is valid for User authority and does not require a zoning edit session or an admin session.

members [alias]
Displays all members of the alias given by [alias]. This keyword is available with User authority and does not require a zoning edit session or an admin session.

remove [alias] [members]
Removes the ports given by [members] from the alias given by [alias]. [members] can have one of the following formats:

■   Domain ID and port number pair (Domain ID, Port Number). Domain IDs and port numbers are in decimal. Ports are numbered beginning with 0.

■   6-character device Fibre Channel address (hex)

■   16-character hexadecimal worldwide port name (WWPN) for the device with the format xx:xx:xx:xx:xx:xx:xx:xx.

rename [alias_old] [alias_new]
Renames the alias given by [alias_old] to the alias given by [alias_new].

Config Command

Manages the Fibre Channel configurations on a switch. For information about setting the port and switch configurations, refer to the "Set Config Command" on page A-24.

Authority   Admin for all keywords except List

Syntax   **config**
    <u>act</u>ivate *[config]*
    backup
    cancel
    copy [config_source] [config_destination]
    <u>del</u>ete [config]
    edit *[config]*
    list
    restore
    save *[config]*

Keywords   <u>act</u>ivate *[config]*
Activates the configuration given by [config]. If you omit the configuration, the currently active configuration is used. SANbox2 supports up to 10 configurations (only one can be active at a time).

backup
Creates a file named *configdata*, which contains the system configuration information. This file should be downloaded from the switch using FTP and stored in a safe place.

cancel
Terminates the current configuration edit session without saving changes that were made.

copy [config_source] [config_destination]
Copies the configuration given by [config_source] to the configuration given by [config_destination].

delete [config]
Deletes the specified configuration file where [config] is a file name.

edit *[config]*
Opens the an edit session for the configuration given by [config]. If you omit the configuration name, the currently active configuration is used. SANbox2 supports up to 10 configurations (only one can be active at a time).

list
Displays a list of all available configurations. This keyword is available with User authority.

restore
Restores configuration settings to the switch from a backup file named *configdata*, which must be first uploaded on the switch using FTP. You create the backup file

using the Config Backup command. Use FTP to load the backup file on a switch, then enter the Config Restore command.

save *[config]*
Saves changes made during a configuration edit session in the configuration given by [config]. If you omit the configuration name value, the configuration you chose for the Config Edit command is used.

Notes If you edit the active configuration, changes will be held in suspense until you reactivate the configuration or activate another configuration.

Examples The following shows an example of how to open and close a Config Edit session:

```
SANbox2 $> admin start


SANbox2 (admin) #> config edit
.
.
.
SANbox2 (admin-config) #> config cancel


  Configuration mode will be canceled.Please confirm (y/n): [n] y


SANbox2 (admin) #> admin end


SANbox2 $>
```

Date Command

This command displays or sets the system date and time. To set the date and time the information string must be provided in this format: MMDDhhmmCCYY.

Authority   Admin

Syntax   **date**
                 [MMDDhhmmCCYY]

Keywords   *[MMDDhhmmCCYY]*
                 Specifies the date. If you omit the keyword value, the current date is displayed.

Examples   The following is an example of the Date command:

```
SANbox2 $> date
  Tue Jun 12 07:51:24 2001
```

Fallback Command

Loads the fallback version of the firmware from switch memory. The switch stores two versions of the firmware. This command alternately activates the two versions.

Authority   Admin

Syntax   **fallback**

Notes
- The Show Switch command displays the available firmware versions and the currently active version.
- After executing the Fallback command, reset the switch for the firmware to placed in effect.

Examples   The following is an example of the Fallback command:

```
SANbox2 $> admin start


SANbox2 (admin) #> fallback


  Reverting to previous software image.  Please confirm (y/n): [n] y


SANbox2 $> admin end


SANbox2 $>
```

Help Command

Displays a brief description of the specified command and its keywords.

Authority   User

Syntax   **help** *[command] [keyword]*

Keywords   *[command]*
A command name. If you omit this value, the system displays all available commands from which to choose.

[keyword]
A keyword associated with the command named by [command]. If you omit this value, the system displays the available keywords for the specified command.

all
Displays a list of all available commands (including command variations).

Examples   The following is an example of the Help Set command:

```
SANbox2 $> help set


set SET_OPTIONS
There are many attributes that can be set.
Type help with one of the following to get more information:
    set beacon
    set config port
    set config ports
    set config switch
    set log
    set port
    set setup snmp
    set setup system
    set switch
```

The following is an example of the Help Set Beacon command:

```
SANbox2 $> help set beacon
set beacon On | Off
This command allows the lights on the front of the switch to flash.
The On option will start and the Off option will stop the flashing.
```

History Command

Displays a numbered list of the previously entered commands from which you can re-execute selected commands.

Authority   User

Syntax   **history**

Notes   Use the History command to provide context for the ! command:

■   Enter ![command] to re-enter the most recent execution of that command.

■   Enter ![line number] to re-execute the corresponding command from the History display

■   Enter ![partial command string] to re-execute a command that matches the command string.

■   Enter !! to re-execute the most recent command.

Examples   The following is an example of the History command:

```
SANbox2 $> history
   1 show switch
   2 date
   3 help set
   4 history


SANbox2 $> !3
help set


set SET_OPTIONS
There are many attributes that can be set.
Type help with one of the following to get more information:
    set beacon
    set config port
    set config ports
    set config switch
    set log
    set port
    set setup snmp
    set setup system
    set switch
```

Image Command

Manages and installs switch firmware.

Authority   Admin

Syntax   **image**
cleanup
fetch [account_name] [ip_address] [file_source] [file_destination]
list
unpack [file]

Keywords   **cleanup**
Removes the firmware image file from the switch. The firmware image file is removed automatically each time the switch is reset.

fetch [account_name] [ip_address] [file_source] [file_destination]
Retrieves image file given by [file_source] and stores it on the switch with the file name given by [file_destination]. The image file is retrieved from the device with the IP address given by [ip_address] and an account name given by [account_name]. If an account name needs a password to access the device, the system will prompted you for it.

list
Displays the list of image files that reside on the switch.

unpack [file]
Installs the firmware file given by [file]. After unpacking the file, a message appears confirming successful unpacking. The switch must be reset for the new firmware to take effect.

Lip Command

Reinitializes the specified loop port.

Authority   Admin

Syntax   **lip [port_number]**

Keywords   **[port_number]**
The number of the port to be reinitialized.

Examples   The following is an example of the Lip command:

```
SANbox2 (admin) #> lip 2
```

Passwd Command

Changes a user account's password.

Authority   Admin

Syntax   **passwd [account_name]**

Keywords   **[account_name]**
The user account name.

Examples   The following is an example of the Passwd command:

```
SANbox2 (admin) #> passwd user2


        Press 'q' and the ENTER key to abort this command.


  account OLD password               :
  account NEW password (4-20 chars)  :


  please confirm account NEW password:


  password has been changed.
```

Ps Command

Displays current system process information.

Authority   User

Syntax   **ps**

Examples   The following is an example of the Ps command:

```
SANbox2 $> ps

PID  PPID %CPU    TIME    ELAPSED COMMAND
298   292  0.0 00:00:00 59:42       cns
299   292  0.0 00:00:00 59:42       ens
300   292  0.0 00:00:00 59:42       dlog
301   292  0.3 00:00:53 59:42       ds
302   292  0.2 00:00:29 59:42       mgmtApp
303   292  0.0 00:00:02 59:42       nserver
304   292  0.0 00:00:00 59:42       mserver
305   292  0.1 00:00:15 59:42       util
306   292  0.0 00:00:04 59:42       eport
307   292  1.2 00:02:53 59:41       PortApp
308   292  0.0 00:00:01 59:41       zoning
309   292  0.0 00:00:00 59:41       diagApp
```

Quit Command

Closes the Telnet session.

Authority User

Syntax **quit, exit, or logout**

Reset Command

Resets the switch and port configuration parameters.

Authority   Admin

Syntax   **reset**
config
factory
port [port_number]
snmp
switch (default)
system
zoning

Keywords   **config**

Resets the configuration settings for the switch and its ports to the factory default values. Refer to Table A-2 and Table A-3 for switch and port configuration default values.

factory

Resets switch, port, SNMP, and system configuration settings to the factory default values. Refer to Table A-2 through Table A-5.

port [port_number]

Reinitializes the port given by [port_number]. Ports are numbered beginning with 0.

snmp

Resets the SNMP configuration settings to the factory default values. Refer to Table A-4 for SNMP configuration default values.

switch

Reinitializes the switch. This command also closes the Telnet session.

system

Resets the system configuration settings to the factory default values. Refer to Table A-5 for system configuration default values.

zoning

Resets the zoning configuration settings to the factory default settings. This keyword clears all zoning definitions on the switch.

Notes   The following tables specify the various factory default settings:

Table A-2. Switch Configuration Defaults

Parameter	Default
Admin State	Online
Broadcast Enable	False
Domain ID	1
Domain ID Lock	True
Symbolic Name	SANbox2
R_T_TOV	100
R_A_TOV	10000
E_D_TOV	2000
FS_TOV	5000
DS_TOV	5000
Principal Priority	254
Description	Undefined

Table A-3. Port Configuration Defaults

Parameter	Default
Admin State	Online
Link Speed	Auto
Port Type	GL
TL_Port Mode	True
ISL Security	Any
Symbolic Name	Port
ALFairness	False
ARB_FF	False
InteropCredit	0
ExtCredit	0
FanEnable	True

Table A-3. Port Configuration Defaults (Continued)

Parameter	Default
LCFEnable	False
MFSEnable	False
MFS_TOV	640
MSEnable	True
NoClose	False
IOStreamGuard	False
VIEnable	False
CheckAlps	False

Table A-4. SNMP Configuration Defaults

Parameter	Default
Contact	Undefined
Location	Undefined
Description	Undefined
Trap [1-5] Enabled	False
Trap [1-5] Address	127.0.0.1
Trap [1-5] Port	Undefined
Trap [1-5] Severity	Warning
ObjectID	1663.1.1.1.1.111.3.6.1.4.1
AuthFailureTrap	False

Table A-5. System Configuration Defaults

Parameter	Default
Network IP Address	10.0.0.1
Network IP Mask	255.0.0.0
Gateway Address	10.0.0.254
Network Discovery	Static
Admin Timeout	30 minutes
Security Enabled	False
Remotelog Enabled	False
LogHost IP Address	Undefined

Set Alarm Clear Command

Clears the log (list) of alarms.

Authority   User

Syntax   **set alarm clear**

Examples   The following example clears the list of alarms.

```
SANbox2 $> set alarm clear
```

Set Beacon Command

Assists in locating a switch by causing all port Logged-In LEDs on the switch to flash.

Authority   User

Syntax   **set beacon [state]**

Keywords   **[state]**
Enables or disables the flashing of the port Logged-In LEDs according to [state].

On
Enables the flashing beacon.

Off
Disables the flashing beacon.

Examples   The following examples enables and disables the beacon:

```
SANbox2 $> set beacon on


  Command succeeded.


SANbox2 $> set beacon off


  Command succeeded.
```

Set Config Command

Sets switch, port, and zoning configuration parameters.

Authority   Admin authority within a Config Edit session

Syntax   **set config**
    port *[port_number]*
    ports *[port_number]*
    switch
    zoning

Keywords   **port *[port_number]***
Changes configuration parameters for the port number given by [port_number]. If you omit this value, the system begins with port 0 and proceeds in order through port 15 or until you enter "qq". The system displays each parameter one line at a time and prompts you for a value. For each parameter, enter a new value or press the Enter key to accept the current value shown in brackets.

ports *[port_number]*
Very similar to the Set Config Port command, except that any attribute value that is changed by the user is applied to ALL ports. ONLY attribute values that are changed are updated; the attribute values that are not changed are left alone. Ports are numbered beginning with 0. The default is port 0. The system displays each parameter one line at a time and prompts you for a value. For each parameter, enter a new value or press the Enter key to accept the current value shown in brackets. Admin and config edit modes are required for this command.

Table A-6. Set Config Port Parameters

Parameter	Description
AdminState	Port administrative state: online, offline, diagnostics, or down
LinkSpeed	1Gb/sec or 2 Gb/sec
PortType	Type of port
TLPortMode	Initiates the configuration of ports attributes. Indicates whether using initiator or target devices on the loop. If [port_number] is specified then the user will be presented with attributes for that port only; otherwise, all attributes for all ports will be available for configuration.

Table A-6. Set Config Port Parameters (Continued)

Parameter	Description
ISLSecurity	E_Port security. Determines which switches a port will establish a link with. ■ ANY - we will link with any switch. ■ Ours - we will only link to another SANbox2 switch. ■ None - the port will not establish an ISL link.
SymbolicPortName	Descriptive name
ALFairness	Default is switch that has priority
ARB_FF	Use ARB_FF instead of idles on loop FCAL option
InteropCredit	Number of buffer-to-buffer credits per port. 0 means the default (12) is unchanged.
ExtCredit	Extended credit port
FANEnable	Fabric Address Notification. If enabled, notifies logged-in NL_Ports of the FL_Ports's address, port name, and node name.
LCFEnable	Link control frame preference, R_CTL = 0xC
MFSEnable	Multi-Frame Sequence bundling
MFS_TOV	MFS limit for camp on
MSEnable	Management Server enable on this port
NoClose	Don't close unless another devices arbitrates
I/O Stream Guard	Enables or disables the suppression of RSCN messages
VIEnable	Enable VI preference routing
CheckAlps	Close before sending frames to new target

switch
Initiates an editing session in which to change switch configuration settings. The system displays each parameter one line at a time and prompts you for a value. For each parameter, enter a new value or press the Enter key to accept the current value shown in brackets.

Table A-7. Set Config Switch Parameters

Parameter	Description
AdminState	Switch administrative state: online, offline, or diagnostics.
Broadcast Enable	Enables or disables (default) forwarding if broadcasting frames.
DefaultDomainID	Default domain ID setting
DomainIDLock	If set to True (default), prevents domain ID from being changed.
SymbolicName	Descriptive name
R_T_TOV	Receiver Transmitter Timeout Value. Specifies the number of milliseconds a port is to wait to receive a response from another port. The default is 100.
R_A_TOV	Resource Allocation Timeout Value. The number of milliseconds the switch waits to allow two ports to allocate enough resources to establish a link. The default is 10000.
E_D_TOV	Error Detect Timeout Value. The number of milliseconds a port is to wait for errors to clear. The default is 2000 msec.
FS_TOV	Fabric Stability Timeout Value. The default is 5000 msec.
DS_TOV	Distributed Services Timeout Value (Management Server, Name Server). The default is 5000 msec.
PrincipalPriority	The priority used in the FC-SW-2 principal switch selection algorithm. 1 is high, 255 is low.
Description	The name for the configuration. The default is undefined.

zoning

Initiates an editing session in which to change switch zoning attributes. The
system displays each parameter one line at a time and prompts you for a value.
For each parameter, enter a new value or press the Enter key to accept the
current value shown in brackets.

Table A-8. Set Config Zoning Parameters

Parameter	Description
AutoSave	Determines whether zoning changes will be saved to flash (non-volatile) memory or to RAM (volatile) in each switch. The default is On.
Default	Determines communication among ports/devices in the absence of an active zone set. "All" enables all ports/devices to communicate with one another. "None" prohibits communication among ports/devices.
Merge Mode	Enables SANbox2 switch to interoperate with switches running non-FC-SW-2 compliant firmware.

Examples   The following is an example of the Set Config Port command:

```
SANbox2 $> admin start
SANbox2 (admin) #> config edit
SANbox2 (admin-config) #> set config port 1

  A list of attributes with formatting and current values will follow.
  Enter a new value or simply press the ENTER key to accept the default value.
  If you wish to terminate this process before reaching the end of the list
  press 'q' or 'Q' and the ENTER key to do so.


  Configuring Port Number:  1
  -----------------------

  AdminState    (1=Online, 2=Offline, 3=Diagnostics, 4=Down) [Online]
  LinkSpeed     (1=1Gb/s, 2=2Gb/s, 3=Auto)                   [Auto  ]
  PortType      (TL / GL / G / F / FL / Donor)               [GL    ]
  TLPortMode    (1=TLTargetMode, 2=TLInitiatorMode)          [TLInitiatorMode]
  ISLSecurity   (Any /  Ours / None)                         [Any   ]
  SymPortName   (string, max=32 chars)                       [Port2 ]
  ALFairness    (True / False)                               [False ]
```

```
ARB_FF       (True / False)                          [False ]
InteropCredit (decimal value, 0-255)                 [0     ]
ExtCredit    (decimal value, 0-65535)                [0     ]
FANEnable    (True / False)                          [True  ]
LCFEnable    (True / False)                          [False ]
MFSEnable    (True / False)                          [False ]
MFS_TOV      (decimal value, 10-20480 msec)          [640   ]
MSEnable     (True / False)                          [True  ]
NoClose      (True / False)                          [False ]
I/O Stream Guard -
             (Suppress RSCN)(Enable / Disable)       [Disable]
VIEnable     (True / False)                          [False ]
CheckAlps    (True / False)                          [False ]


Finished configuring attributes.
This configuration must be saved (see config save command) and
activated (see config activate command) before it can take effect.
To discard this configuration use the config cancel command.
```

The following is an example of the Set Config Switch command:

```
SANbox2 $> admin start
SANbox2 (admin) #> config edit
SANbox2 (admin-config) #> set config switch

 A list of attributes with formatting and default values will follow.
 Enter a new value or simply press the ENTER key to accept the default value.
 If you wish to terminate this process before reaching the end of the list
 press 'q' or 'Q' and the ENTER key to do so.

 AdminState        (1=Online, 2=Offline, 3=Diagnostics) [Online       ]
 BroadcastEnable   (True / False)                       [False        ]
 DefaultDomainID   (decimal value, 1-239)               [11           ]
 DomainIDLock      (True / False)                       [True         ]
 SymbolicName      (string, max=32 chars)               [bottom switch]
 R_T_TOV           (decimal value, 1-1000 msec)         [100          ]
 R_A_TOV           (decimal value, 100-100000 msec)     [10000        ]
 E_D_TOV           (decimal value, 10-20000 msec)       [2000         ]
 FS_TOV            (decimal value, 100-100000 msec)     [5000         ]
 DS_TOV            (decimal value, 100-100000 msec)     [5000         ]
 PrincipalPriority (decimal value, 1-255)               [254          ]
 Description       (string, max=32 chars)               [             ]
```

The following is an example of the Set Config Zoning command.

```
SANbox2 $> admin start
SANbox2 (admin) #> config edit
SANbox2 (admin-config) #> set config zoning

A list of attributes with formatting and current values will follow.
Enter a new value or simply press the ENTER key to accept the default value.
If you wish to terminate this process before reaching the end of the list
  press 'q' or 'Q' and the ENTER key to do so.

  AutoSave      (True / False)  [True]
  Default       (All / None)    [All ]
  Merge Mode    (Brocade / SW2) [SW2 ]

  Finished configuring attributes.
  This configuration must be saved (see config save command) and
  activated (see config activate command) before it can take effect.
  To discard this configuration use the config cancel command.
```

Set Log Command

Specifies the type of entries to be entered in the event log. The log is a storage file contained on the switch. The log can hold a maximum of 200 entries. When the log becomes full, the entries are replaced, starting with the oldest entry, to produce a list of the last 200 events which occurred. Log entries are created for ports, components, and event severity levels, based on the settings defined for the active configuration.

Authority   Admin

Syntax   **set log**
    archive
    clear
    component [list]
    level [level]
    port [ports]
    restore
    save
    start (default)
    stop

Keywords   **archive**
Archives the log entries to a file on the switch named *logfile that* can be downloaded from the switch using FTP. (FTP to the switch, log in with username/password of "images" for both, and type "get logfile".)

clear
Clears all log entries.

component [list]
Specifies one or more components to monitor for events. Use spaces to delimit values in the list. Choose one or more of the following values:

all
Monitors all components. To maintain optimal switch performance, do not use this setting with the Level keyword set to Info.

blade
Monitors modular circuit boards in cabinets, racks, and high-port-count switches.

chassis
Monitors chassis hardware components such as fans and power supplies.

eport
Monitors all E_Ports.

mgmtserver
Monitors management server status.

nameserver
Monitors name server status.

Monitor none of the component events.

other
Monitors other miscellaneous events.

port
Monitors all port events

switch
Monitors switch management events.

Zoning
Monitors zoning conflict events.

level [level]
Specifies the severity level given by [level] to use in monitoring events for the specified components or ports. [level] can be one of the following values:

critical
Monitors critical events.

warn
Monitors warning events.

info
Monitors informational events. To maintain optimal switch performance, do not use this setting with the Component keyword set to All.

none
Monitors none of the severity levels.

port [ports]
Specifies one or more ports to monitor for events. Choose one of the following values:

<port number list>
Specifies port or ports to monitor. Use spaces to delimit values in the list. Ports are numbered beginning with 0.

all
Specifies all ports.

none
Disables monitoring on all ports.

restore
Returns the port, component, and level settings to the default values.

save
Saves the log settings for the component, level and port. These settings remain in effect after a switch reset. To retrieve the actual log entries, refer to the Set Log Archive command.

start
Starts the logging of events based on the Port, Component, and Level keywords assigned to the active configuration. The logging continues until you enter the Set Log Stop command.

stop
Stops logging of events.

Notes   To maintain optimal switch performance, do not set the Component keyword to All and the Level keyword to Info at the same time.

Set Port Command

Sets port state and speed for the specified port temporarily until the next switch reset or new configuration activation. This command also clears port counters.

Authority   Admin

Syntax   **set port [port_number]**
>   bypass
>   clear
>   enable
>   speed [transmission_speed]
>   state [admin_state]

Keywords   **[port_number]**
Specifies the port. Ports are numbered beginning with 0.

bypass
Sends a Loop Port Bypass (LPB) to a specific Arbitrated Loop Physical Address (ALPA) or to all ALPAs on the arbitrated loop.

clear
Clears the counters on the specified port.

enable
Sends a Loop Port Enable (LPE) to all ALPAs on the arbitrated loop.

speed [transmission_speed]
Specifies the transmission speed for the specified port. Choose one of the following port speed values:

>   1Gb/s
>   One gigabit per second.
>
>   2Gb/s
>   2 gigabits per second.
>
>   Auto
>   The port speed is automatically detected.

state [admin_state]
Specifies the administrative state for the specified port. Choose one of the following port state values:

>   online
>   Places the port online.
>
>   offline
>   Places the port offline.
>
>   diagnostics
>   Prepares the port for testing.
>
>   down
>   Disables the port.

Set Setup Command

Changes SNMP and system configuration settings. The switch maintains one SNMP configuration and one system configuration.

Authority   Admin

Syntax   **set setup**
     snmp
      system

Keywords   **snmp**
Prompts you in a line-by-line fashion to change SNMP configuration settings. Table A-9 describes the SNMP fields. For each parameter, enter a new value or press the Enter key to accept the current value shown in brackets.

Table A-9. SNMP Configuration Settings

Entry	Description
Contact	Specifies the name of the person to be contacted to respond to trap events. The default is undefined.
Location	Specifies the switch location. The default is undefined.
Trap [1-5] Enabled	Specifies whether traps (event information) are enabled or disabled (default).
Trap [1-5] Address	Specifies the IP address to which SNMP traps are sent. The default is 127.0.0.1.
Trap [1-5] Port	Specifies the port for which SNMP traps are sent.
Trap [1-5] Severity	Specifies the severity level to use when monitoring trap events. The default is Warning
ReadCommunity	Read Community Authentication. A write-only field; the value on the switch and the SNMP management server must be the same.
WriteCommunity	Write Community Authentication. A write-only field; the value on the switch and the SNMP management server must be the same.
TrapCommunity	Trap Community Authentication. A write-only field; the value on the switch and the SNMP management server must be the same.
AuthFailureTrap	Specifies the IP address where a notification is sent in the event of an authentication failure.

system

Prompts you in a line-by-line fashion to change system configuration settings. Table A-10 describes the system configuration fields. For each parameter, enter a new value or press the Enter key to accept the current value shown in brackets.

Table A-10. System Configuration Settings

Entry	Description
NetworkIPAddress	Internet Protocol (IP) address for the Ethernet port.
NetworkIPMask	Subnet mask address for the Ethernet port.
GatewayIPAddress	IP address gateway.
NetworkDiscovery	Boot Method (1 - Static, 2 - Bootp, 3 - DHCP, 4 - RARP)
AdminTimeout	Specifies the amount of time in minutes the switch waits before terminating an idle Admin session. Zero (0) disables the time out threshold. The default is 30, the maximum is 1440.
Security Enabled	Enables or disables the enforcement of account names and passwords.
Remote Log Enabled	Whether remote logging of is enabled or disabled. If enabled, log information is saved to a remote host that supports the syslog protocol.
LogHost IP Address	The IP address of the host that will receive the remote log information if remote logging is enabled.

Notes   The two components of SANbox2 security are user authentication and fabric security. The user must be authenticated before gaining access to a switch. If an invalid account name/password combination is entered, that user can not access the switch, and thus can not gain access to the fabric. If security is enabled (on) and a valid account name/password combination is entered, that user can access the switch but can not execute any command that exceeds their authority (privileges) level. If security is disabled (off) and a valid account name/password combination is entered, that user has access to all switches in the fabric and can execute all commands (both user and admin), regardless of their authority (privileges) level.

Examples   The following is an example of the Set Setup SNMP command:

```
SANbox2 $> admin start
SANbox2 (admin) #> set setup snmp

  A list of attributes with formatting and current values will follow.
  Enter a new value or simply press the ENTER key to accept the default value.
  If you wish to terminate this process before reaching the end of the list
```

```
press 'q' or 'Q' and the ENTER key to do so.


Trap Severity Options
---------------------
unknown, emergency, alert, critical, error, warning, notify, info, debug


Contact            (string, max=32 chars)      [Technical Support]
Location           (string, max=32 chars)      [TSLab          ]
Trap1Enabled       (True / False)              [True           ]
Trap1Address       (dot-notated IP Address)    [10.20.71.15    ]
Trap1Port          (decimal value)             [162            ]
Trap1Severity      (see allowed options above) [warning        ]
Trap2Enabled       (True / False)              [False          ]
Trap2Address       (dot-notated IP Address)    [0.0.0.0        ]
Trap2Port          (decimal value)             [162            ]
Trap2Severity      (see allowed options above) [warning        ]
Trap3Enabled       (True / False)              [False          ]
Trap3Address       (dot-notated IP Address)    [0.0.0.0        ]
Trap3Port          (decimal value)             [162            ]
Trap3Severity      (see allowed options above) [warning        ]
Trap4Enabled       (True / False)              [False          ]
Trap4Address       (dot-notated IP Address)    [0.0.0.0        ]
Trap4Port          (decimal value)             [162            ]
Trap4Severity      (see allowed options above) [warning        ]
Trap5Enabled       (True / False)              [False          ]
Trap5Address       (dot-notated IP Address)    [0.0.0.0        ]
Trap5Port          (decimal value)             [162            ]
Trap5Severity      (see allowed options above) [warning        ]
ReadCommunity      (string, max=32 chars)      [public         ]
WriteCommunity     (string, max=32 chars)      [private        ]
TrapCommunity      (string, max=32 chars)      [public         ]
AuthFailureTrap    (True / False)              [False          ]


Do you want to save and activate this snmp setup? (y/n) [ ]
```

The following is an example of the Set Setup System command:

```
SANbox2 $> admin start
SANbox2 (admin) #> set setup system


  A list of attributes with formatting and current values will follow.
  Enter a new value or simply press the ENTER key to accept the default value.
  If you wish to terminate this process before reaching the end of the list
  press 'q' or 'Q' and the ENTER key to do so.

  NetworkIPAddress  (dot-notated IP Address)                [172.22.10.170]
  NetworkIPMask     (dot-notated IP Address)                [255.255.252.0]
  GatewayIPAddress  (dot-notated IP Address)                [172.22.8.254 ]
  NetworkDiscovery  (1=Static, 2=Bootp, 3=Dhcp, 4=Rarp) [Dhcp        ]
  AdminTimeout      (dec value 0-1440 minutes, 0=never) [30          ]
  SecurityEnable    (True / False)                        [False       ]
  RemoteLogEnable   (True / False)                        [False       ]
  LogHost IP Address (True / False)                       [False       ]
```

Set Switch Command

Temporarily changes the administrative state for all ports on the switch. The previous Set Config Switch settings are restored after a switch reset or a reactivation of a switch configuration.

Authority   Admin

Syntax   **set switch**
state [admin_state]

Keywords   **state [admin_state]**
Specifies the administrative state as given by [admin_state]:

online
Places all ports online

offline
Places all ports offline.

diagnostics
Prepares all ports for testing.

Show Command

Displays fabric, switch, and port operational information.

Authority   User

Syntax   **show**
      about
      alarm
      broadcast
      chassis
      config [option]
      domains
      donor
      fabric
      intro
      log *[option]*
      lsdb
      mem [count]
      ns
      perf *[option]*
      port *[port_number]*
      setup [option]
      steering *[domain_id]*
      switch
      topology
      users

Keywords   **about**
Displays an introductory set of information about operational attributes of the switch. It is functionally equivalent to the Show Intro command.

alarm
Displays the last 200 alarm entries.

broadcast
Displays the broadcast tree information and all ports that are currently transmitting and receiving broadcast frames.

chassis
Displays chassis component status and temperature.

config [option]
Displays switch and port configuration attributes. Refer to the Show Config Command on page A-48.

domains
Displays list of each domain and its worldwide name in the fabric.

donor
Displays list of current donor configuration for all ports.

fabric

Displays list of each domain, fabric ID, worldwide name, node IP address, port IP address, and symbolic name in the fabric.

intro

Displays an introductory set of information about operational attributes of the switch. It is functionally equivalent to the Show About command.

log *[option]*

Displays log entries. Refer to the Show Log Command on page A-50.

lsdb

Displays Link State database information.

mem [count]

Displays information about memory activity in 1K block units. [count] is the number of updates at 1 second intervals.

ns

Displays name server information.

perf *[option]*

Displays performance information for all ports. Refer to the Show Perf Command on page A-52.

port *[port_number]*

Displays operational information for the port given by [port_number]. Ports are numbered beginning with 0. If the port number is omitted, information is displayed for all ports. Table A-11 describes the port parameters.

Table A-11. Show Port Parameters

Entry	Description
Alinit	Incremented each time the port begins AL initialization.
AlinitError	Number of times the port entered initialization and the initialization failed.
ClassXFramesIn	Number of class *x* frames received by this port.
ClassXFramesOut	Number of class *x* frames sent by this port.
ClassXWordsIn	Number of class *x* words received by this port.
ClassXWordsOut	Number of class *x* words sent by this port.
DecodeError	Decoding error detected.

Table A-11. Show Port Parameters (Continued)

Entry	Description
FBusy	Number of times the switch sent a P_BSY because Class 2 frame could not be delivered within ED_TOV time. Number of class 2 and class 3 fabric busy (F_BSY) frames generated by this port in response to incoming frames. This usually indicates a busy condition on the fabric or N_port that is preventing delivery of this frame.
Flowerrors	Received a frame when there were no available credits.
FReject	Number of frames from devices that were rejected.
InvalidCRC	Invalid CRC detected.
InvalidDestAddr	Invalid destination address detected.
LIP ALPD ALPS	Number of F7, AL_PS LIPs, or AL_PD (vendor specific) resets, performed.
LIPF7ALPS	This LIP is used to reinitialize the loop. An L_port, identified by AL_PS, may have noticed a performance degradation and is trying to restore the loop.
LIPF8ALPS	This LIP denotes a loop failure detected by the L_port identified by AL_PS.
LIPF7F7	A loop initialization primitive frame used to acquire a valid AL_PA.
LIPF8F7	A loop initialization primitive frame used to indicate that a loop failure has been detected at the receiver.
Link Failures	Number of optical link failures detected by this port. A link failure is a loss of synchronization for a period of time greater than the value of R_T_TOV or by loss of signal while not in the offline state. A loss of signal causes the switch to attempt to re-establish the link. If the link is not re-established by the time specified by R_T_TOV, a link failure is counted. A link reset is performed after a link failure.
Login	Time when user logged in.
Logout	Time when user logged out.
LoopTimeouts	A two (2) second timeout as specified by FC-AL-2.
LossOfSync	Number of synchronization losses (>100 ms) detected by this port. A loss of synchronization is detected by receipt of an invalid transmission word.

Table A-11. Show Port Parameters (Continued)

Entry	Description
PrimSeqErrors	Primitive sequence errors detected.
RxLinkResets	Number of link reset primatives received from an attached device.
RxOfflineSeq	Number of offline sequences received. An OLS is issued for link initialization, a Receive & Recognize Not_Operational (NOS) state, or to enter the offline state.
TotalErrors	Total number of errors detected.
TotalLIPsRecvd	Number of loop initialization primitive frames received by this port.
TotalLinkResets	Total number of link reset primatives.
TotalOfflineSeq	Total number of Offline Sequences issued by this port.
TotalRxFrames	Total number of frames received by this port.
TotalRxWords	Total number of words received by this port.
TotalTxFrames	Total number of frames issued by this port.
TotalTxWords	Total number of words issued by this port.
TxLinkResets	Number of Link Resets issued by this port.
TxOfflineSeq	Total number of Offline Sequences issued by this port.
TxWait	Time waiting to transmit when blocked with no credit. Measured in FC Word times

setup [option]
Displays setup attributes for the system, SNMP, and the switch manufacturer.
Refer to the Show Setup Command on page A-53.

steering *[domain_id]*
Displays the routes that data takes to the switch given by [domain_id]. If you omit
[domain_id], the system displays routes for all switches in the fabric.

switch
Displays switch operational information.

topology
Displays all connected devices.

users
Displays all user logins.

Examples   The following is an example of the Show Chassis command:

```
SANbox2 $> show chassis

  Chassis Information
  -------------------
  BoardTemp (1) - Degrees Celsius   32
  BoardTemp (2) - Degrees Celsius   36
  FanStatus (1)                     Good
  FanStatus (2)                     Good
  PowerSupplyStatus (1)             Good
  PowerSupplyStatus (2)             Good
```

The following is an example of the Show Domains command:

```
SANbox2 $> show domains

  Principal switch is (local): 10:00:00:c0:dd:00:90:6b

  Domain ID List:
        Domain 22 (0x16)          WWN = 10:00:00:c0:dd:00:90:6b
```

The following is an example of the Show Fabric command:

```
SANbox2 $> show fabric

Switch ID     WWN          NodeIPAddress PortIPAddress SymbolicName
------ --     ---          ------------- ------------- ------------
100    fffc64 10:00:00:60:69:20:4c:a2
103    fffc67 10:00:00:c0:dd:00:b9:09
104    fffc68 10:00:00:c0:dd:00:b8:4b
```

The following is an example of the Show Setup SNMP command:

```
SANbox2 $> show setup snmp

  SNMP Information
  ----------------
  Contact            Technical Support
  Location           TSLab
  Description        QLogic SANbox2 FC Switch
  Trap1Enabled       True
  Trap1Address       10.20.71.15
  Trap1Port          162
  Trap1Severity      warning
  Trap2Enabled       False
  Trap2Address       0.0.0.0
  Trap2Port          162
  Trap2Severity      warning
  Trap3Enabled       False
  Trap3Address       0.0.0.0
  Trap3Port          162
  Trap3Severity      warning
  Trap4Enabled       False
  Trap4Address       0.0.0.0
  Trap4Port          162
  Trap4Severity      warning
  Trap5Enabled       False
  Trap5Address       0.0.0.0
  Trap5Port          162
  Trap5Severity      warning
  ObjectID           1.3.6.1.4.1.1663.1.1.1.1.11
  AuthFailureTrap    False
```

The following is an example of the Show Topology command:

```
SANbox2 $> show topology
Port Local Local Remote Remote Unique
Number Type PortWWN Type NodeWWN ID
------ ----- ------- ------ ------- ------
0 E 20:00:00:c0:dd:00:b8:4b E 10:00:00:c0:dd:00:b8:4b 67
1 E 20:01:00:c0:dd:00:b8:4b E 10:00:00:c0:dd:00:b8:4b 67
11 TL 20:0b:00:c0:dd:00:b8:4b
NL 50:80:02:00:00:06:d5:38 75
NL 20:00:00:20:37:2b:08:c9 7a
NL 20:00:00:20:37:2b:01:2c 7c
```

```
NL 20:00:00:20:37:2b:05:c9 80
NL 20:00:00:20:37:2b:09:5e 81
NL 20:00:00:20:37:2b:09:20 82
13 TL 20:0d:00:c0:dd:00:b8:4b NL 50:80:02:00:00:06:d5:38 75
NL 20:00:00:20:37:2b:08:c9 7a
NL 20:00:00:20:37:2b:01:2c 7c
NL 20:00:00:20:37:2b:05:c9 80
NL 20:00:00:20:37:2b:09:5e 81
NL 20:00:00:20:37:2b:09:20 82
NL 20:00:00:20:37:2b:07:d8 84
NL 20:00:00:20:37:2b:0a:98 88
NL 20:00:00:20:37:2b:0a:90 8f
NL 20:00:00:20:37:2b:05:22 90
NL 20:00:00:20:37:2b:09:ca 97
NL 20:00:00:20:37:2b:07:bd 98
15 FL 20:0f:00:c0:dd:00:b8:4b NL 20:00:00:20:37:d9:48:81 1f
NL 20:00:00:20:37:d9:4a:76 23
NL 20:00:00:20:37:d9:4b:33 25
NL 20:00:00:20:37:d9:4b:61 8f
```

The following is an example of the Show Topology (for Port #11) command:

```
SANbox2 #> show topology 11
Local Link Information
---------------------
PortNumber 11
PortID 680b00
PortWWN 20:0b:00:c0:dd:00:b8:4b
PortType TL
Remote Link Information
----------------------
Device 0
NodeWWN 50:80:02:00:00:06:d5:38
PortType NL
Description (NULL)
IPAddress 0.0.0.0
Device 1
NodeWWN 20:00:00:20:37:2b:08:c9
PortType NL
Description (NULL)
IPAddress 0.0.0.0
Device 2
```

```
Description (NULL)
IPAddress 0.0.0.0


Device 3


NodeWWN 20:00:00:20:37:2b:05:c9
PortType NL
Description (NULL)
IPAddress 0.0.0.0
```

The following is an example of the Show Port command:

```
SANbox2 $> show port 3


  Port Number: 3
  --------------
  AdminState       Online              OperationalState Offline
  AsicNumber       1                   PortID           050300
  AsicPort         3                   PortWWN          20:03:00:c0:dd:00:90:6b
  ConfigType       GL                  RunningType      Unknown
  DiagStatus       Passed              SFPPartNumber    Unknown
  EpConnState      None                SFPRevision      0
  EpIsoReason      NotApplicable       SFPType          NotInstalled
  LinkSpeed        Auto                SFPVendor        Unknown
  LinkState        Inactive            SFPVendorID      0
  LoginStatus      NotLoggedIn         SymbolicName     Port3
  MaxCredit        12                  SyncStatus       SyncLost


  ALInit           1      FReject           0      RxLinkResets     0
  ALInitError      0      InvalidCRC        0      RxOfflineSeq     0
  Class2FramesIn   0      InvalidDestAddr   0      TotalErrors      0
  Class2FramesOut  0      LIP_AL_PD_AL_PS   0      TotalLIPsRecvd   0
  Class2WordsIn    0      LIP_F7_AL_PS      0      TotalLinkResets  0
  Class2WordsOut   0      LIP_F7_F7         0      TotalOfflineSeq  2
  Class3FramesIn   0      LIP_F8_AL_PS      0      TotalRxFrames    0
  Class3FramesOut  0      LIP_F8_F7         0      TotalRxWords     0
  Class3Toss       0      LinkFailures      0      TotalTxFrames    0
  Class3WordsIn    0      Login             0      TotalTxWords     0
  Class3WordsOut   0      Logout            0      TxLinkResets     0
  DecodeError      0      LoopTimeouts      0      TxOfflineSeq     2
  FBusy            0      LossOfSync        0      TxWait           0
  FlowErrors       0      PrimSeqErrors     0
```

The following is an example of the Show Switch command:

```
SANbox2 $> show switch
Switch Information
------------------
SymbolicName                     SANbox2-203
SwitchWWN                        10:00:00:c0:dd:00:b8:b5
SwitchType                       SANbox2-16
PromVersion                      V0.1-5-18  (Fri Jun 15 10:22:09 2001)
CreditPool                       0
DomainID                         3
LogLevel                         Info
MaxPorts                         16
NumberOfAsics                    1
NumberOfPortsPerAsic             16
NumberOfResets                   127
ReasonForLastReset               NormalReset
SWImageVersion (1) - build date  V0.4-6-16  (Thu Jun 14 04:06:42 2001)
SWImageVersion (2) - build date  V0.4-6-18  (Fri Jun 15 10:22:09 2001)
ActiveConfiguration              default
ActiveSWImage                    2
AdminState                       Online
AdminModeActive                  False
BeaconOnStatus                   False
OperationalState                 Online
PrincipalSwitchRole              False
BoardTemp (1) - Degrees Celsius  32
BoardTemp (2) - Degrees Celsius  36
SwitchDiagnosticsStatus          Passed
SwitchTemperatureStatus          Normal
```

Show Config Command

Display switch and port attributes for the active configuration.

Authority User

Syntax **show config**
    port *[port_number]*
    switch
    zoning

Keywords **port *[port_number]***
Displays configuration parameters for the port number given by [port_number]. Ports are numbered beginning with 0. If the port value is omitted, all ports are specified.

switch
Displays configuration parameters for the switch.

zoning
Displays zoning configuration parameters for the switch.

Examples The following is an example of the Show Config Port command:

```
SANbox2 $> show config port 3

  Configuration Name: default

  -------------------

  Port Number: 3

  ------------

  AdminState      Online

  LinkSpeed       Auto

  PortType        GL

  TLPortMode      TLInitiatorMode

  ISLSecurity     Any

  SymbolicName    Port4

  ALFairness      False

  ARB_FF          False

  InteropCredit   0

  FanEnable       True

  ExtCredit       0

  FanEnable       False

  LCFEnable       False

  MFSEnable       False

  MFS_TOV         640

  MSEnable        False

  NoClose         False

  IOStreamGuard   False

  VIEnable        False

  CheckAlps       False
```

The following is an example of the Show Config Switch command:

```
SANbox2 $> show config switch

  Configuration Name: default
  -------------------

  Switch Configuration Information
  -------------------------------
  AdminState          Online
  BroadcastEnable     False
  DomainID            11
  DomainIDLock        True
  SymbolicName        bottom switch
  R_T_TOV             100
  R_A_TOV             10000
  E_D_TOV             2000
  FS_TOV              5000
  DS_TOV              5000
  PrincipalPriority   254
  Description
```

The following is an example of the Show Config Zoning command:

```
SANbox2 $> show config zoning

 Configuration Name: default
  -------------------

  Zoning Configuration Information
  -------------------------------
  AutoSave            True
  Default             All
  Merge Mode          SW2
```

Show Log Command

Displays the contents of the log or the parameters used to create entries in the log. The log contains a maximum of 200 entries. When the log reaches its entry capacity, subsequent entries overwrite the existing entries, beginning with the oldest.

Authority   User

Syntax   **show log**
      component
      level
      options
      port
      settings

Keywords   **component**
Displays the components currently being monitored for events.

level
Displays the event severity level needed to create an entry in the log. If the severity level occurs on a port or on a component which is not defined, no entry is made in the log.

options
Displays the options used to set the component and log level attributes.

port
Displays the ports being monitored for events. If an event occurs which is of the defined level and on a defined component, but not on a defined port, no entry is made in the log.

settings
Displays the current settings for component, level and port. This command is equivalent to executing the following commands separately: Show Log Component, Show Log Level, and Show Log Port.

Examples   The following is an example of the Show Log Component command:

```
SANbox2 $> show log component


  Current setting(s) for log component: NameServer
```

The following is an example of the Show Log Level command:

```
SANbox2 $> show log level


  Current setting(s) for log level: Info
```

The following is an example of the Show Log Options command:

```
SANbox2 $> show log options

  Allowed options for '    level': Critical,Warn,Info,None

  Allowed options for 'component': All,None,NameServer,MgmtServer,Zoning,Switch,
Chassis,Blade,Port,Eport,Snmp,Other
```

The following is an example of the Show Log command:

```
[327][Wed Jan 25 09:36:54.860 1989][I][Eport:0xdd00b8b6.304.4 Port: 0/8][Eport
 State = E_A0_GET_DOMAIN_ID]
   [328][Wed Jan 25 09:36:54.860 1989][I][Eport:0xdd00b8b6.304.4 Port: 0/8][FSPF
 PortUp state=0]
   [329][Wed Jan 25 09:36:54.861 1989][I][Eport:0xdd00b8b6.304.4 Port: 0/8][Send
ing init hello]
   [330][Wed Jan 25 09:36:54.861 1989][I][Eport:0xdd00b8b6.304.4 Port: 0/8][Proc
essing EFP, oxid= 0x8]
   [331][Wed Jan 25 09:36:54.861 1989][I][Eport:0xdd00b8b6.304.4 Port: 0/8][Epor
t State = E_A2_IDLE]
   [332][Wed Jan 25 09:36:54.861 1989][I][Eport:0xdd00b8b6.304.4 Port: 0/8][EFP,
 WWN= 0x100000c0dd00b845, len= 0x30]
   [333][Wed Jan 25 09:36:54.864 1989][I][Eport:0xdd00b8b6.304.4 Port: 0/8][Send
ing LSU oxid= 0xc: type= 1]
   [334][Wed Jan 25 09:36:54.864 1989][I][Eport:0xdd00b8b6.304.4 Port: 0/8][Send
 Zone Merge Request]
   [335][Wed Jan 25 09:36:54.865 1989][I][Eport:0xdd00b8b6.304.4 Port: 0/8][LSDB
 Xchg timer set]
   [336][Wed Jan 25 09:36:54.865 1989][I][Eport:0xdd00b8b6.304.4 Port: 0/8][Sett
ing attribute Oper.UserPort.0.8.EpConnState Connected]
```

Show Perf Command

Displays performance data for all ports.

Authority   User

Syntax   **show perf**
   byte [bytes/sec]
   frame [frames/sec]

Keywords   **byte** *[bytes/sec]*
Displays port performance data for all ports in bytes/second. The display is refreshed according to the interval in seconds given by [*bytes/sec*]. If [*bytes/sec*] is omitted, the display is refreshed every second. Type "q" and press the Enter key to stop the display.

frame *[frames/sec]*
Displays port performance data for all ports in frames/second. The display is refreshed according to the interval in seconds given by [*frames/sec*]. If [*frames/sec*] is omitted, the display is refreshed every second. Type "q" and press the Enter key to stop the display.

Notes   The Show Perf command with no keywords displays performance data in frames/second and bytes/second at that moment.

Examples   The following is an example of the Show Perf Byte command:

```
SANbox2 $> show perf byte


  Displaying bytes/sec data...  (Press 'q' and the ENTER key to stop display)


  0    1    2    3    4    5    6    7    8    9    10   11   12   13   14   15


  ------------------------------------------------------------------------------
  0    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0

  0    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0

  0    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0
```

Show Setup Command

Displays the current SNMP and system settings.

Authority   User

Syntax   **show setup**
   snmp
   system

Keywords   **snmp**
Displays the current SNMP settings.

system
Displays the current system settings.

Examples   The following is an example of the Show Setup Snmp command:

```
SANbox2 $> show setup snmp

  SNMP Information

  ----------------

  Contact              <sysContact undefined>
  Location             <sysLocation undefined>
  Description          QLogic SANBox2 FC Switch
  Trap1Enabled         False
  Trap1Address         10.0.0.254
  Trap1Port            162
  Trap1Severity        warning
  Trap2Enabled         False
  Trap2Address         0.0.0.0
  Trap2Port            162
  Trap2Severity        warning
  Trap3Enabled         False
  Trap3Address         0.0.0.0
  Trap3Port            162
  Trap3Severity        warning
  Trap4Enabled         False
  Trap4Address         0.0.0.0
  Trap4Port            162
  Trap4Severity        warning
  Trap5Enabled         False
  Trap5Address         0.0.0.0
  Trap5Port            162
  Trap5Severity        warning
  ObjectID             1.3.6.1.4.1.1663.1.1.1.1.11
  AuthFailureTrap      False
```

The following is an example of the Show Setup System command:

```
SANbox2 $> show setup system

   System Information
   ------------------
   NetworkIPAddress      172.22.11.202
   NetworkIPMask         255.255.252.0
   GatewayIPAddress      172.22.8.254
   NetworkDiscovery      Static
   AdminTimeout          30
   SecurityEnable        False
   RemoteLogEnable       False
   LogHostIPAddress      undefined
```

Shutdown Command

Terminates all data transfers on the switch at convenient points and closes the Telnet session.

Authority   Admin

Syntax   **shutdown**

Test Command

Performs the port loopback test to verify the operation of a port. The three types of loopback tests are Internal (SerDes level), External (SFP), and Online. While the test is running, the remaining ports on the switch remain fully operational.

Authority   Admin

Syntax   **test [port_number]** *[test_type]*

Keywords   **[port_number]**
Specifies the port. Ports are numbered beginning with 0.

[test_type]
The test type. If you omit [test_type], the internal loopback test is run. [test_type] can be one of the following values:

cancel
Cancels online test in progress.

internal
Tests the SerDes.

external
Tests both the SerDes and SFP. Requires a loopback plug be installed in the SFP.

online
Tests one online port.

status
Displays the status of a test in progress, or if there is no test in progress, the status of the test that was executed last.

Examples   To run Internal (SerDes) or External (SFP) port tests, do the following:

1.   To start an Admin session, enter the following command and press the Enter key.

```
admin start
```

2.   Place the port in Diagnostics mode, enter the following command (*x* = port number) and press the Enter key.

```
set port x state diagnostics
```

3.   Insert the loopback plug into the SFP on the selected port.

4.   Choose one of the two types of Port Loopback Tests to run:

■   To run an internal loopback test, enter the following and press the Enter key:

```
test x internal
```

■   To run an external loopback test, enter the following command. A loopback plug must be installed for this test to pass.

```
test x external
```

5.   After the test type has been chosen and the command executed, a message on the screen will appear detailing the test results.

6.   After the test is run, put the port back into online state by entering the following command (*x* = port number) and pressing the Enter key.

```
set port x state online
```

7.   To verify port is back online, enter the following command and press the Enter key. The contents of the AdminState field should display be "Online".

```
show port x
```

The online loopback (node-to-node) test can test only one port at a time, and that port must be online and connected to a remote device. To run the online loopback test, do the following:

1.   To start an Admin session, enter the following command and press the Enter key.

```
admin start
```

2.   To run the online loopback test, enter the following command and press the Enter key.

```
test x online
```

3.   A series of test parameters are displayed on the screen. Press the Enter key to accept each default parameter value, or type a new value for each parameter and press the Enter key. The TestLength parameter is the number of frames sent, the FrameSize (256 byte maximum in some cases) parameter is the number of bytes in each frame, and the DataPattern parameter is the pattern in the payload. Before running the test, make sure that the device attached to the port can handle the test parameters.

```
SANbox2N107 (admin) #> test x online

A list of attributes with formatting and current values will
follow. Enter a new value or simply press the ENTER key to
accept the default value. If you wish to terminate this
process before reaching the end of the list press 'q' or 'Q'
and the ENTER key to do so.

  TestLength    (decimal value, 1-4294967295)    [100    ]

  FrameSize     (decimal value, 36-2148)          [256    ]

  DataPattern   (32-bit hex value or 'Default')  [Default]

  StopOnError   (True/False)                      [False  ]

  Do you want to start the test? (y/n) [n]
```

4.   After all parameter values are defined, press the Y key to start the test.

Uptime Command

Displays the elapsed time since the switch was last reset and reset method.

Authority   User

Syntax   **uptime**

Examples   The following is an example of the Uptime command:

```
SANbox2 $> uptime

  Elapsed up time  : 0 day(s), 2 hour(s), 28 min(s), 44 sec(s)
  Reason last reset: NormalReset
```

User Command

Administers or displays user accounts.

Authority Admin

Syntax **user**
accounts
add
<u>del</u>ete [account_name]
list

Keywords **accounts**
Displays all user accounts that exist on the switch.

add
Add a user account to the switch. After this command is executed, the administrator will be prompted for the information needed to establish the user account.

delete [account_name]
Deletes the account name given by [account_name] from the switch.

list
Displays the list of users currently logged in and their session numbers. Provides the same function as the Show User command. This keyword is valid for User authority and does not require an admin session.

Examples The following is an example of the User Accounts command:

```
SANbox2 (admin) #> user accounts


  Current list of user accounts
  ----------------------------
  admin       (admin authority = True)
  user1       (admin authority = False)
  user2       (admin authority = False)
  user3       (admin authority = True)
```

The following is an example of the User Add command:

```
SANbox2 (admin) #> user add

    Press 'q' and the ENTER key to abort this command.

  account name (1-15 chars)     : user3
  account password (4-20 chars) :

  please confirm account password:
```

```
should this account have admin authority? (y/n) [n] : y

OK to add user account 'user3' with admin authority?
Please confirm (y/n): [n] y
```

The following is an example of the User Delete command:

```
SANbox2 (admin) #> user del user3

  The user account will be deleted.  Please confirm (y/n): [n] y
```

The following is an example of the User List command:

```
SANbox2 (admin) #> user list

  Current list of users logged in
  -----------------------------
  admin@OB-session1 - in admin mode
  admin@OB-session2
  user1@OB-session3


SANbox2 (admin) #>
```

Whoami Command

Displays the account name, session number, and switch domain ID for the Telnet session.

Authority   User

Syntax   **whoami**

Examples   The following is an example of the Whoami command:

```
SANbox2 $> whoami

User name:admin@session2
Switch name:SANbox2
Switch domain ID:1
```

Zone Command

Manages zones and zone membership on a switch. The Zone command defines members (ports and devices) for a single switch. Zones are members of zone sets.

Authority   Admin authority within a Zoning Edit session. Refer to the Zoning Command on page A-67. List, Members, and zone sets keywords are available with User authority and do not require a Zoning Edit session.

Syntax   **zone**
        add [zone] [members]
        copy [zone_source] [zone_destination]
        create [zone]
        <u>del</u>ete [zone]
        list
        members [zone]
        remove [zone] [members]
        rename [zone_old [zone_new]
        type [zone] *[zone_type]*
        zonesets [zone]

Keywords   **add [zone] [members]**
Specifies one or more ports given by [members] to add to the zone named [zone]. The application verifies that the [zone] format is correct, but does not validate that such a port exists. [members] can have one of the following formats:

■   Domain ID and port number pair (Domain ID, Port Number). Domain IDs and port numbers are in decimal. Ports are numbered beginning with 0.

■   6-character device Fibre Channel address (hex)

■   16-character hexadecimal worldwide port name (WWPN) with the format xx:xx:xx:xx:xx:xx:xx:xx.

■   Alias name

copy [zone_source] [zone_destination]
Creates a new zone named [zone_destination] and copies the membership into it from the zone given by [zone_source].

create [zone]
Creates a zone with the name given by [zone]. The zone name can have a maximum of 64 alpha-numeric characters without spaces.

<u>del</u>ete [zone]
Deletes the specified zone given by [zone] from the zoning database. If the zone is a member of the active zone set, the zone will not be removed from the active zone set until the active zone set is deactivated.

list
Displays a list of all zones and the zone sets of which they are members. This keyword is valid for User authority and does not require a zoning edit session.

members [zone]
Displays all members of the zone given by [zone]. This keyword is available with User authority and does not require a Zoning Edit session.

remove [zone] [members]
Removes the ports given by [members] from the zone given by [zone]. The [members] can have one of the following formats:

■   Domain ID and port number pair (Domain ID, Port Number). Domain IDs and port numbers are in decimal. Ports are numbered beginning with 0.

■   6-character device Fibre Channel address (hex)

■   16-character hexadecimal worldwide port name (WWPN) with the format xx:xx:xx:xx:xx:xx:xx:xx.

■   Alias name

rename [zone_old] [zone_new]
Renames the zone given by [zone_old] to the zone given by [zone_new].

type [zone] *[zone_type]*
Specifies the zone type given by [zone_type] to be assigned to the zone name given by [zone]. If you omit the [zone_type], the system displays the zone type for the zone given by [zone]. [zone_type] can be one of the following:

soft
Name server zone

hardacl
Access control list hard zone

hardvpf
Virtual private fabric hard zone

zonesets [zone]
Displays all zone sets of which the zone given by [zone] is a member. This keyword is available with User authority and does not require a Zoning Edit session.

Examples   The following is an example of the Zone List command:

```
SANbox2 $> zone list


  Zone          ZoneSet
  ------------------
  wwn_b0241f

          zone_set_1


  wwn_23bd31

          zone_set_1


  wwn_221416
```

```
                      zone_set_1

        wwn_2215c3
                      zone_set_1

        wwn_0160ed
                      zone_set_1

        wwn_c001b0
                      zone_set_1

        wwn_401248
                      zone_set_1

        wwn_02402f
                      zone_set_1

        wwn_22412f
                      zone_set_1
```

The following is an example of the Zone Members command:

```
SANbox2 $> zone members wwn_b0241f

  Current List of Members for Zone: wwn_b0241f
  --------------------------------
  50:06:04:82:bf:d2:18:c2
  50:06:04:82:bf:d2:18:d2
  21:00:00:e0:8b:02:41:2f
```

The following is an example of the Zone Zonesets command:

```
SANbox2 $> zone zonesets zone1

  Current List of ZoneSets for Zone: wwn_b0241f
  ---------------------------------
  zone_set_1
```

Zoneset Command

Manages zone sets and zone set membership across the fabric.

Authority   Admin authority within a Zoning Edit session. Refer to the Zoning Command on page A-67. Active, List, Zones keywords are available with User authority. You must close the Zoning Edit session before using the Activate and Deactivate keywords.

Syntax   **zoneset**
>   active
>   <u>act</u>ivate [zone_set]
>   add [zone_set] [zone_list or alias]
>   copy [zone_set_source] [zone_set_destination]
>   create [zone_set]
>   <u>deact</u>ivate
>   <u>del</u>ete [zone_set]
>   list
>   remove [zone_set] [zone_list or alias]
>   rename [zone_set_old] [zone_set_new]
>   zones [zone_set]

Keywords   **active**
Displays the name of the active zone set. This keyword is available with User authority and does not require a Zoning Edit session.

<u>act</u>ivate [zone_set]
Activates the zone set given by [zone_set]. This keyword deactivates the active zone set. Close the Zoning Edit session before using this keyword.

add [zone_set] [zone_list or alias]
Adds one or more zones given by [zone_list] to the zone set given by [zone]. [zone_list] can be an alias. This keyword requires a Zoning Edit session.

copy [zone_set_source] [zone_set_destination]
Creates a new zone set named [zone_set_destination] and copies into it the membership from the zone set given by [zone_set_source]. This keyword requires a Zoning Edit session.

create [zone_set]
Creates the zone set with the name given by [zone_set]. A zone set name can have a maximum of 64 alpha-numeric characters without spaces. This keyword requires a Zoning Edit session.

<u>deact</u>ivate
Deactivates the active zone set. Close the Zoning Edit session before using this keyword.

<u>del</u>ete [zone_set]
Deletes the zone set given by [zone_set]. If the specified zone set is active, the command is suspended until the zone set is deactivated. This keyword requires a Zoning Edit session.

list
Displays a list of all zone sets. This keyword is available with User authority and does not require a Zoning Edit session.

remove [zone_set] [zone_list]
Removes one or more zones given by [zone_list] from the zone set given by [zone_set]. If [zone_set] is the active zone set, the zone will not removed until the zone set has been deactivated. [zone_list] can be an alias. This keyword requires a Zoning Edit session.

rename [zone_set_old] [zone_set_new]
Renames the zone set given by [zone_set_old] to the name given by [zone_set_new]. You can rename the active zone set. This keyword requires a Zoning Edit session.

zones [zone_set]
Displays all zones that are members of the zone set given by [zone_set]. This keyword is available with User authority and does not need a Zoning Edit session.

Notes
■ A zone set must be active for its definitions to be applied to the fabric.

■ Only one zone set can be active at one time.

■ A zone can be a member of more than one zone set.

Examples The following is an example of the Zoneset Active command:

```
SANbox2 $> zoneset active

  The active ZoneSet is:  Beta
```

The following is an example of the Zoneset List command:

```
SANbox2 $> zoneset list


  Current List of ZoneSets
  -----------------------
  alpha
  beta
```

The following is an example of the Zoneset Zones command:

```
SANbox2 $> zoneset zones ssss


  Current List of Zones for ZoneSet: ssss
  --------------------------------
  zone1
  zone2
  zone3
```

Zoning Command

Opens a Zoning Edit session in which to create and manage zone sets and zones. Refer to the Zone Command on page A-62 and the Zoneset Command on page A-65.

Authority   Admin. The List keyword is available with User authority.

Syntax   **zoning**
       cancel
       clear
       edit
       list
       restore
       save

Keywords   **cancel**
Closes the current Zoning Edit session. Any unsaved changes are lost.

clear
Clears all zoning definitions in the volatile edit copy of the zoning database. This keyword does not affect the non-volatile zoning database. However, if you enter the Zoning Clear command followed by the Zoning Save command, the non-volatile zoning database will be cleared from the switch. The preferred method for clearing the zoning database from the switch is the Reset Zoning command.

edit
Opens a Zoning Edit session.

list
Lists all fabric zoning definitions. This keyword is available with User authority.

restore
Reverts the changes applied to the zoning database with the Zoning Save command.

save
Saves changes made during the current Zoning Edit session. The system will inform you that the zone set must be activated to implement any changes. This does not apply if you entered the Zoning Clear command during the Zoning Edit session.

Examples   The following is an example of the Zoning Edit command:

```
SANbox2 $> admin start

SANbox2 (admin) #> zoning edit

SANbox2 (admin-zoning) #>
.
.
SANbox2 (admin-zoning) #> zoning cancel

  Zoning edit mode will be canceled.  Please confirm (y/n): [n]   y

SANbox2 (admin) #> admin end
```

The following is an example of the Zoning List command:

```
SANbox2 $> zoning list

  Active ZoneSet Information

  ZoneSet      Zone       ZoneMember
  -------------------------------
  wwn
            wwn_b0241f
                      50:06:04:82:bf:d2:18:c2
                      50:06:04:82:bf:d2:18:d2
                      21:00:00:e0:8b:02:41:2f

            wwn_23bd31
                      50:06:04:82:bf:d2:18:c2
                      50:06:04:82:bf:d2:18:d2
                      10:00:00:00:c9:23:bd:31

            wwn_221416
                      50:06:04:82:bf:d2:18:c2
                      50:06:04:82:bf:d2:18:d2
                      10:00:00:00:c9:22:14:16

            wwn_2215c3
                      50:06:04:82:bf:d2:18:c2
                      50:06:04:82:bf:d2:18:d2
                      10:00:00:00:c9:22:15:c3
```

```
Configured Zoning Information

ZoneSet     Zone       ZoneMember
-------------------------------
wwn
        wwn_b0241f
                    50:06:04:82:bf:d2:18:c2
                    50:06:04:82:bf:d2:18:d2
                    21:00:00:e0:8b:02:41:2f


        wwn_23bd31
                    50:06:04:82:bf:d2:18:c2
                    50:06:04:82:bf:d2:18:d2
                    10:00:00:00:c9:23:bd:31


        wwn_221416
                    50:06:04:82:bf:d2:18:c2
                    50:06:04:82:bf:d2:18:d2
                    10:00:00:00:c9:22:14:16


        wwn_2215c3
                    50:06:04:82:bf:d2:18:c2
                    50:06:04:82:bf:d2:18:d2
                    10:00:00:00:c9:22:15:c3
```

Notes

Glossary

Activity LED

A port LED that indicates when frames are entering or leaving the port.

Alias

A collection of objects that can be zoned together. An alias is not a zone, and can not have a zone or another alias as a member.

AL_PA

Arbitrated Loop Physical Address

Arbitrated Loop

A Fibre Channel topology where ports use arbitration to establish a point-to-point circuit.

Arbitrated Loop Physical Address (AL_PA)

A unique one-byte valid value assigned during loop initialization to each NL_Port on a Loop.

ASIC

Application Specific Integrated Circuit

BootP

A type of network server.

Buffer Credit

A measure of port buffer capacity equal to one frame.

Class 2 Service

A service which multiplexes frames at frame boundaries to or from one or more N_Ports wit h acknowledgment provided.

Class 3 Service

A service which multiplexes frames at frame boundaries to or from one or more N_Ports without acknowledgment.

Domain ID

User defined name that identifies the switch in the fabric.

E_Port

Expansion port. A switch port that connects to another FC-SW-2 compliant switch.

Expansion Port

See E_Port.

Fabric Management Switch

The switch through which the fabric is managed.

Fabric Name

User defined name associated with the file that contains user list data for the fabric.

Fan Fail LED

An LED that indicates that a cooling fan in the switch is operating below standard.

FC-PLDA

Fibre Channel Private Loop Direct Attach

Flash Memory

Memory on the switch that contains the chassis control firmware.

Frame

Data unit consisting of a start-of-frame (SOF) delimiter, header, data payload, CRC, and an end-of-frame (EOF) delimiter.

FRU

Field Replaceable Unit

Heartbeat LED

A chassis LED that indicates the status of the internal switch processor and the results of the Power-On Self-Test.

Initiator

The device that initiates a data exchange with a target device.

In-Order-Delivery

A feature that requires that frames be received in the same order in which they were sent.

Input Power LED

A chassis LED that indicates that the switch logic circuitry is receiving proper DC voltages.

IP

Internet Protocol

LIP

Loop Initialization Primitive sequence

Logged-In LED

A port LED that indicates device login or loop initialization status.

Management Information Base

A set of guidelines and definitions for the Fibre Channel functions.

Management Workstation

PC workstation that manages the fabric through the fabric management switch.

MIB

Management Information Base

NL_Port

Node Loop Port. A Fibre Channel device port that supports arbitrated loop protocol.

N_Port

Node Port. A Fibre Channel device port in a point-to-point or fabric connection.

Output Power LED

A power supply LED that indicates that the power supply is providing DC voltage to the switch.

Over Temperature LED

A chassis LED or a power supply LED that indicates that the switch or power supply is overheating.

POST

Power On Self Test

Power On Self Test (POST)

Diagnostics that the switch chassis performs at start up.

Private Device

A device that can communicate only with other devices on the same loop.

Private Loop

A loop of private devices connected to a single switch port.

SANbox Manager

Switch management application.

SFF

Small Form-Factor transceiver.

SFP

Small Form-Factor Pluggable. A transceiver device, smaller than a GigaBit Interface Converter, that plugs into the Fibre Channel port.

Small Form Factor

A transceiver device, smaller than a GigaBit Interface Converter, that is permanently attached to the circuit board.

Small Form-Factor Pluggable

A transceiver device, smaller than a GigaBit Interface Converter, that plugs into the Fibre Channel port.

SNMP

Simple Network Management Protocol

Target

A storage device that responds to an initiator device.

VCCI

Voluntary Control Council for Interference

Worldwide Name (WWN)

A unique 64-bit address assigned to a device by the device manufacturer.

WWN

Worldwide Name

Zone

A set of ports or devices grouped together to control the exchange of information.

Zone Set

A set of zones grouped together. The active zone set defines the zoning for a fabric.

Notes

Index